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FM 17-1

DEPARTMENT OF THE ARMY FIELD MANUAL

**ARMOR
OPERATIONS**



HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1963

FIELD MANUAL

No. 17-1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 20 June 1963**ARMOR OPERATIONS**

		Paragraphs	Page
CHAPTER	1. GENERAL		
	Section I. Purpose and scope.....	1-4	5
	II. The role of armor units.....	5-9	5
	III. Armor mission and capabilities.....	10, 11	6
CHAPTER	2. FUNDAMENTALS OF ARMOR		
	Section I. Principles of war.....	12, 13	8
	II. Considerations of active and nonactive nuclear warfare.....	14-16	9
	III. Fundamentals of employment.....	17-28	10
	IV. Factors affecting employment.....	29-33	12
	V. Organization for combat.....	34-42	15
	VI. Planning armor operations.....	43-47	17
	VII. Conduct of armor operations.....	48, 49	20
	VIII. Control.....	50-54	20
CHAPTER	3. COMMAND		
	Section I. Command and leadership.....	55-60	23
	II. Troop leading procedure.....	61-63	25
CHAPTER	4. THE COMMANDER AND HIS STAFF		
	Section I. The commander.....	64, 65	30
	II. The battalion staff.....	66-74	30
CHAPTER	5. RECONNAISSANCE AND SECURITY OPERATIONS		
	Section I. Reconnaissance operations.....	75-91	39
	II. Security.....	92-110	45
CHAPTER	6. LOGISTICS		
	Section I. General.....	111-113	58
	II. Duties of logistical personnel.....	114-118	59
	III. Brigade trains.....	119-122	62
	IV. Battalion or squadron logistical elements and trains.....	123-127	62
	V. Company and troop logistical elements and trains.....	128-131	64
	VI. Employment of trains.....	132-136	66
	VII. Logistical support operations, battalion or squadron.....	137-148	68
	VIII. Supply.....	149-156	73
	IX. Maintenance.....	157-164	76
	X. Medical service.....	165-169	81
	XI. Area damage control.....	170-180	82
CHAPTER	7. THE OFFENSIVE		
	Section I. General.....	181	90
	II. Considerations of the offense.....	182, 183	90
	III. Planning for the attack.....	184-190	91
	IV. Conduct of the attack.....	191-195	96
	V. Types of offensive operations.....	196-202	100
	VI. Passage of lines.....	203-205	104
	VII. Reconnaissance in force.....	206-208	106
	VIII. Meeting engagement.....	209-211	106
	IX. Procedures and techniques of the bypass.....	212-214	108
	X. Night attacks.....	215-220	110

*This manual supersedes FM 17-1, 23 August 1957, including C 1, 10 December 1959, and C 2, 2 September 1960.

		Paragraphs	Page
CHAPTER	8. DEFENSIVE OPERATIONS		
Section I.	General.....	221-226	114
II.	Organization of the defense.....	227-236	116
III.	Mobile defense.....	237-243	120
IV.	Area defense.....	244-253	125
CHAPTER	9. RETROGRADE OPERATIONS		
Section I.	General.....	254, 255	128
II.	Considerations of the retrograde.....	256-260	128
III.	Delaying action.....	261-263	130
IV.	Withdrawal.....	264-268	137
V.	Retirement.....	269, 270	139
VI.	Withdrawal through a rearward position.....	271, 272	139
CHAPTER	10. COMBAT SUPPORT		
Section I.	General.....	273	141
II.	Field artillery support.....	274-278	141
III.	Army aviation.....	279-281	145
IV.	Chemical.....	282, 283	146
V.	Engineer.....	284	147
VI.	Communications.....	285-289	149
VII.	Tactical air support.....	290-295	150
VIII.	Intelligence.....	296-301	152
CHAPTER	11. OTHER OPERATIONS—ENVIRONMENT		
Section I.	General.....	302, 303	155
II.	Jungle operations.....	304-307	155
III.	Desert operations.....	308-310	156
IV.	Operations in deep snow and extreme cold.....	311-313	157
V.	Mountain operations.....	314-317	158
CHAPTER	12. OTHER OPERATIONS—MISSION TYPE		
Section I.	General.....	318	160
II.	Airmobile operations.....	319	160
III.	Linkup operations.....	320-323	160
IV.	Raids.....	324-326	161
V.	Tank sweeps.....	327-330	162
VI.	Operations in forests or wooded areas.....	331-335	163
VII.	Operations at defiles.....	336-339	166
VIII.	Operations at rivers.....	340-352	169
IX.	Operations against fortified positions.....	353-355	177
X.	Operations in built-up areas.....	356-365	179
XI.	Amphibious operations.....	366-383	187
XII.	Shore-to-shore movements.....	384-389	194
XIII.	Operations against irregular (insurgent) forces.....	390-392	196
XIV.	Division rear area security.....	393-396	199
APPENDIX	I. REFERENCES.....		204
	II. COMMAND FACILITIES.....		207
	III. STAFF RELATION IN SELECTED OPERATIONS ACTIVITIES.....		212
	IV. STAFF RECORDS.....		217
	V. REPORTS AND WARNINGS.....		220
	VI. MOVEMENTS.....		227
	VII. ESTIMATE OF THE SITUATION.....		244
	VIII. COMMANDER'S APPLICATION OF PRINCIPLES OF WAR.....		249
	IX. OPERATION ORDERS AND PLANS.....		257
	X. CONTROL MEASURES AND OVERLAY TECHNIQUES.....		271
	XI. GUIDE FOR THE PREPARATION OF FIRE PLANS.....		280
	XII. HANDLING PRISONERS OF WAR.....		281
	XIII. TANK UNITS, CONDUCT OF FIRE AND MOVEMENT BY A MANEUVER FORCE.....		283

	Paragraphs	Page
APPENDIX XIV. ORGANIC FIRE SUPPORT.....	-----	288
XV. NIGHT COMBAT TECHNIQUES.....	-----	301
XVI. ILLUMINATION PLAN.....	-----	315
XVII. TASK ORGANIZATION.....	-----	317
XVIII. EMPLOYMENT OF THE ARMORED VEHICLE LAUNCHED BRIDGE (AVLB).	-----	319
XIX. MINE WARFARE.....	-----	322
XX. OBSTACLE PLANNING, EMPLOYMENT, AND EXECUTION.....	-----	332
XXI. TACTICAL EMPLOYMENT AND COMMAND CONTROL OF ATOMIC DEMOLITION MUNITIONS (ADM).	-----	340
XXII. EMPLOYMENT OF GROUND SURVEILLANCE RADAR.....	-----	349
XXIII. PREDICTION OF FALLOUT AND CHEMICAL AND RADIOLOGICAL MONITORING AND SURVEY.	-----	356
XXIV. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL PROTECTIVE MEASURES.	-----	361
XXV. ASSEMBLY AREAS.....	-----	367
INDEX.....	-----	371

CHAPTER 1

GENERAL

Section I. PURPOSE AND SCOPE

1. Purpose

This manual sets forth the doctrine, tactics, techniques, and procedures common to the employment of armor units.

2. Scope

a. This manual provides basic doctrine, tactics, techniques and procedures of employment; exercise of command; reconnaissance and security; logistics; control; movements; and offensive, defensive, retrograde, and special operations appropriate to all armor units. Unless otherwise specified, the material presented herein is applicable without modification to both nuclear and nonnuclear warfare.

b. Users of this manual are encouraged to submit comments or recommendations for changes to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and

proper evaluation. Comments should be forwarded directly to the Commanding Officer, U.S. Army Armor Combat Developments Agency, Fort Knox, Ky.

3. Armor

Armor is a combined arms force designed to conduct mounted combat employing armor-protected vehicles as a principal means of accomplishing a ground combat mission. Armor operates normally within a force structure that may include tanks, mechanized infantry, artillery, engineers, armored cavalry, and Army aviation, supported on the battlefield by a flexible and rapid communication system, and a mobile logistics system.

4. The Role of Armor

Armor conducts decisive, highly mobile, ground-environment warfare, primarily offensive in nature and characterized by a predominance of mounted combat, through the use of both ground and air vehicles.

Section II. THE ROLE OF ARMOR UNITS

5. General

Armor units fight normally as combined arms forces of two or more arms, each complementing the other and aiding the forward movement of the force by employing its own special capabilities. The organization of these combined arms forces is tailored by cross-attachment to use the favorable characteristics of each type unit to complement the strengths and compensate for the weaknesses of other units. Commensurate with its intended employment the resulting force varies in degree of armor protection, mobility, and ability to deliver fire.

6. The Brigade

The brigade is composed of the armored division brigade, the separate armor brigade (referred to hereafter as the brigade), and the armor group command and control attached basic fighting units, that is, combat maneuver battalions, in training and combat operations. The brigade is capable of conducting operations with either a preponderance of tank battalions or mechanized infantry battalions, or a balanced force made up equally of tank and mechanized infantry battalions. Tactical doctrine concerning the brigade is set forth in FM 17-30. The brigade is capable of conducting semi-

independent and independent armor operations when appropriate combat support and combat service support elements are attached.

7. Tank Units

a. Tank Battalions.

- (1) The tank battalion of the armored, mechanized, and infantry divisions and separate brigades is the source of the tank elements for combined arms forces.
- (2) The tank battalion of the airborne division, when equipped with the M56 airborne self-propelled 90-mm AT gun, is the basic unit to deliver heavy caliber direct fire to support dismounted units in the ground phase of an airborne operation. When equipped with the armored reconnaissance/airborne assault vehicle (AR/AAV), the airborne division tank battalion is used to organize combined arms forces.

b. Tank Companies.

- (1) The tank company of the armored cavalry squadron, armored cavalry regiment, is the basic unit used to increase the capability for sustained, mounted combat of the regiment.
- (2) The tank company of the separate airborne brigade, when equipped with the M56 airborne self-propelled 90-mm AT gun, is the basic unit used to deliver heavy caliber direct fire to support dismounted units in the

ground phase of an airborne operation. When equipped with the AR/AAV, the tank company, separate airborne brigade, is used to organize combined arms forces.

8. Mechanized Infantry Battalion

The mechanized infantry battalion of the armored division and separate armor brigade provides the combined arms forces of armor with a force capable of fighting dismounted. It possesses high cross-country mobility, light armor, and multiple means of communication, and complements and enhances the inherent capabilities of tank elements when employed as a part of a tank-infantry team.

9. Armored Cavalry Units

a. The armored cavalry squadron of the armored, mechanized, infantry, and airborne divisions; of the separate brigades; and of the armored cavalry regiment is the basic unit (capable of fighting in air or ground vehicles or dismounted) used for reconnaissance, security, and economy of force missions.

b. The armored cavalry troop of the separate airborne brigade is the basic unit used to perform reconnaissance and security for the brigade.

c. The reconnaissance platoon of the combat maneuver battalions (a combined arms team within itself) is the basic unit (capable of fighting mounted or dismounted) used to perform reconnaissance and security for the battalions.

Section III. ARMOR MISSION AND CAPABILITIES

10. Missions

a. Tank units close with and destroy enemy forces, using fire, maneuver, and shock effect in coordination with other arms.

b. Armored cavalry units perform reconnaissance and provide security for the unit to which organic, assigned, or attached, and engage in offensive, defensive, and delaying action as an economy of force unit.

c. Mechanized infantry units close with the enemy by means of fire and maneuver to destroy or capture him or to repel his assault by fire, close combat, and counterattack.

11. Capabilities

a. General. Armor is capable of operating throughout the spectrum of warfare, from cold war to general war. Armored vehicles are particularly suited to a nuclear environment because their armor protection reduces significantly the effects on personnel of blast and radiation from a nuclear burst and, even at close ranges to such a burst, shields personnel from thermal effects. Armor's inherent characteristics of mobile firepower, mobility, armor protection, shock effect, and responsiveness to command endow it with an optimum capability for accomplishing the following actions.

b. Deep Penetration and Wide Envelopment. Large armor formations with battlefield mobility and maneuverability in whole or by element, controlling heavy nuclear and nonnuclear fire support, provide forces with power and momentum for deep penetrations and wide envelopment. In the enemy's rear areas these forces attain great freedom of action as they maneuver to seize terrain; disrupt communication; destroy command posts, missile sites, artillery, and troop reserves; and capture or destroy supplies.

c. Exploitation. Armor has the combat power to create its own opportunities for exploitation as well as provide the higher commander with a destructive force to exploit rapidly the successes of other formations. For example, the armored division, as a part of the corps, may be used by the corps commander to expand the successes of other forces or the effects of nuclear fires. Objectives appropriate for the armored division are those that are beyond reach of other forces and that will insure success of the corps or field army mission.

d. Mobile Defense. Armor is well suited to the conduct of a mobile defense. Since it is designed primarily for offensive action, it is employed best in defensive operations as the mobile counterattack force of a higher command. The armored division, with or without the use of nuclear weapons, provides the corps and army commander with a powerful reserve for destroying enemy attacking forces. The armor unit's capability to move, live, and fight on the nuclear battlefield permits its employment in compressing or canalizing enemy forces for destruction by nuclear weapons.

e. Destruction of Enemy Armor Formations. Defeat of enemy armor is essential to successful ground combat and is a continuing requirement in offensive and defensive operations. The tank is a primary armor-defeating weapon of armored formations.

f. Reconnaissance/Security. As the range of weapons is extended, as the battlefield becomes

less densely populated, and as units are more widely dispersed, the need for reconnaissance becomes more acute. Armored cavalry units provide reconnaissance for the higher commander by ground and air means. Reconnaissance and security missions demand highly mobile forces with a ground combat capability. These forces detect enemy forces, warn of them, and destroy them within their capabilities. Armored cavalry units are well suited to conduct covering, probing, screening, and rear area security operations and to act as advance, flank, or rear guards. The capability of armor units for rapidly maneuvering great firepower makes them well suited for reconnaissance-in-force operations.

g. Counterguerrilla Operations. Armor units can be employed in antiguerrilla and antiairborne/antiairmobile operations. Terrain may require armor units to be tailored for antiguerrilla operations.

h. Close Support of Infantry. This task is fulfilled most frequently by the tank battalions of the mechanized infantry, infantry, and airborne divisions. Tank battalions increase greatly the firepower and mobility of the infantry attack and defense and provide a powerful armor-defeating capability.

i. Economy of Force. Armored cavalry units are organized and equipped to perform economy of force missions, thus permitting a commander to maneuver the preponderance of his other forces to another area for a decisive blow. Armored cavalry is suited for employment in areas not requiring the combat power of tank units.

j. Counterinsurgency Operations. The armor-protected firepower, shock effect, mobility, and mass of armor are particularly well suited for a show of force role. These characteristics similarly enable armor to conduct successful combat operations against insurgency forces. The ground and air elements of armored cavalry are particularly well suited as a combat counterinsurgency force in difficult terrain.

CHAPTER 2

FUNDAMENTALS OF ARMOR

Section I. PRINCIPLES OF WAR

12. General

a. The principles of war govern the conduct of all military operations. They represent the major factors essential to the successful conduct of war.

b. A successful commander applies the principles to specific situations. He knows when to emphasize one at the expense of others. In some instances a commander may elect not to apply a given principle. If he does so with the knowledge that he is doing it and if the failure to apply the principle works to his ultimate advantage, he has not violated the principle. The commander uses the principles of war during his estimate of the situation. In formulating courses of action, he must consider and compare each course developed in light of the principles. Thus, the commander's decision is a result of the direct application of the principles of war. Appendix VIII provides an example of the commander's application of the principles of war in a specific situation.

13. Application

a. The Objective. The objective of a military force is the goal or aim for which the force was constituted. This principle is overriding, or is always applicable to any operation, at any level of command. The objective of a force can be stated in broad or precise terms depending upon the nature of the goal. Each element of an armor unit contributes to the attainment of the objective of the larger unit of which it is a part. For example, when the objective of a division has been defined, all elements of the division must be assigned objectives that facilitate the attainment of the division objective. The objective or goal of a military force is expressed, in general terms, as a mission. Success

in combat operations is measured by the accomplishment of the mission.

b. The Offensive. By the offensive the commander can impose his will on the enemy, set the pace and course of battle, exploit enemy weaknesses, and meet unexpected contingencies. Even in the defensive the commander must be alert to regain the initiative by offensive counteractions. Aggressiveness, flexibility of mind, and the ability to make rapid, reasoned decisions are required to apply fully the principle of the offensive. In defense, the armor commander can often best accomplish his mission by offensive action.

c. Simplicity. Simplicity demands that detailed, simple plans be adopted in every military operation. It is, of course, a relative term because all actions in war are essentially complex. Simplicity is especially important on the nuclear battlefield, where the full use of available means will require close control and coordination and where plans must be as simple as the situation will permit. Detailed, simple plans lead to coordinated, timely execution.

d. Unity of Command. Unity of command is the establishment of a single authority. This is the best means to insure unity of effort, which implies a singleness of purpose and cooperation by all elements of the command.

e. Mass. Mass demands that superiority of combat power be attained at the critical time and place for a decisive purpose. This superiority is both qualitative and quantitative. Combat power is primarily a combination of firepower and maneuver, which is applied at the right place and time for a decisive purpose. Mass does not require continued concentration of forces; it does require that forces be so disposed that maximum combat power can be concentrated at the decisive time and place. The

use of nuclear weapons by enemy forces will require greater dispersion for passive defense; therefore, greater stress must be placed on the application of mass from the point of view of time rather than space. Whenever possible, tanks are employed in mass. The speed, maneuverability, and communication of armor permit the rapid massing of mobile firepower. The armor leader seeks to concentrate his mobile firepower at one decisive point, overcome that point, then shift to another decisive point. Violation of this principle exposes the commander to the risk of piecemeal defeat by even an inferior enemy.

f. Economy of Force. Economy of force requires that sufficient force be applied at other than the decisive time and place to permit mass to be applied at the point of decision. These two principles are so closely related that they cannot be considered singly. Application of the two principles requires a sound estimate of what is sufficient elsewhere to permit the attainment of decisive superiority at the decisive time and place. "Sufficient" is the key. It connotes the application of the force necessary to accomplish the purpose, and not the application of as little force as possible.

g. Maneuver. Maneuver requires that all military resources be brought to bear in the accomplishment of the objective. Correct application of the principle of maneuver requires not only the full use of combat power at the

decisive time and place but includes the movement of elements of combat power (including combat service support) to the area of operations. Application of this principle is a function of command at all levels. At the highest level it usually means the movement of men, means, and supplies to an area of operations, and at the lowest level it means the positioning of troop units and fires to destroy the enemy.

h. Surprise. Surprise connotes striking the enemy when, where, or in a manner that he is unable to counter effectively. The achievement of surprise is not necessarily dependent upon misleading the enemy as to intentions, such as, for example, concealing from him an intention of attacking. He may know from the situation that he will be attacked, yet the attacker may achieve surprise by the time, place, direction, size or composition of forces, or tactics employed.

i. Security. Security provides readiness for action or counteraction and is enhanced greatly by flexibility. Flexibility in mind, organization, and means contributes to security. Its attainment embraces all measures designed to avoid being surprised or interfered with seriously, and the retention of freedom of action. Security does not imply undue caution and avoidance of all risks, for bold action is essential to success in war. When security is provided, unexpected developments will not interfere seriously with the pursuit of vigorous operations.

Section II. CONSIDERATIONS OF ACTIVE AND NONACTIVE NUCLEAR WARFARE

14. General

a. Basic armor doctrine is generally applicable under conditions of both active and nonactive nuclear war and major changes in tactics and techniques are not required. The impact of nuclear weapons on the battlefield is considered to require, primarily, increased emphasis on dispersion and the armor protection and mobility of armor units. The employment of armor units in nuclear war will not vary significantly from that of the nonactive nuclear environment. Armor missions will remain essentially unchanged and will continue the employment of armor units in wide envelopments or deep penetrations to seize objectives.

b. A primary distinction between the nuclear and nonactive nuclear battlefield may be the dispersion of forces. On the nuclear battlefield, dispersion between principal elements or battalion-sized elements may be required. The requirements for dispersion are not new to armor elements, and massing for the attack or assault can be accomplished in space and time by reason of inherent armor unit mobility.

15. Active Nuclear Warfare

a. Employment of armor on the nuclear battlefield in the offense will be based primarily on forms of offensive operations: the envelopment, the turning movement, the penetration, and the exploitation, including the pursuit.

Each form will assign objectives deep in the enemy rear and the adoption of any one form will depend in varying degrees upon the mission, the terrain, the enemy situation, and the troops available. In a nuclear war, and in regard to the friendly forces' scale of use of nuclear weapons, the penetration as a form of offensive operation may be used more frequently than was previously considered normal for armor units. When time, space, and an assailable flank are available, the envelopment may be used in preference to the penetration. After achieving success through the penetration or envelopment, the attack progresses into an exploitation and pursuit. The preferred use of armor units in the defense is as a mobile counterattack force wherein their inherent characteristics are exploited fully. Organization for combat in the mobile defense will stress the provision of a reserve weighted heavily with tanks. The commander dispersing his forces as a passive defense measure against enemy nuclear weapons must recognize that he may afford the enemy opportunity to infiltrate in force. This countercapability imposes on the friendly command a major tactical consideration to insure thorough surveillance of the areas between the dispersed formations. Such a consideration must recognize the friendly tactical commander's need for adequate ground and air surveillance means, organic, in support, or attached, 24 hours a day in all weather.

b. Greater consideration and use of night or other limited visibility conditions will be a result of a nuclear battlefield environment. Al-

though the techniques of night operations will include the use of equipment such as infrared devices, the principles of movement and combat will not change markedly. Frequency of limited-visibility operations will increase in the conduct of troop movements, realignment of forces on the battlefield, movement to attack positions, movement to lines of departure, and attack of limited objectives.

16. Nonactive Nuclear Warfare

Nonactive nuclear war is a condition in which either the United States or enemy forces or both are required to conduct operations without using nuclear weapons although the threat of their use may be present. The firepower available under conditions of nonactive nuclear war is reduced materially. The tactics of the nonactive nuclear battlefield and the forces employed may be similar to those employed in past wars. The armored division and its subordinate units will continue to be a powerful striking or exploiting force for the corps. Within the division, the brigade will be assigned missions involving wide envelopments or penetrations to seize deep objectives. Brigade commanders and staffs can expect to receive mission-type orders and substantial tactical freedom in carrying out assigned missions. Great reliance is placed on the initiative of brigade and subordinate unit commanders. Normally, brigades will be able to rely on each other for a degree of mutual support. Battlefield maneuver will employ the classic concepts of fire and maneuver.

Section III. FUNDAMENTALS OF EMPLOYMENT

17. General

The effective employment of armor forces is dependent upon certain fundamentals. The degree of success obtained in the use of these fundamentals depends largely on imaginative, resourceful, audacious, prudent, progressive and flexible thinking commanders and staffs. The commander must be willing to take coldly calculated risks.

18. The Soldier

Although the most striking features of armor forces are their powerful weapons and fighting

machines, the successful employment of these material assets in combat depends ultimately on the courage, intelligence, professional competence, and endurance of the soldier.

19. Fire and Maneuver

Armor units fight by combining fire and maneuver. This is a technique, employed by the commander conducting the action, of establishing a base of fire and a maneuvering force. These two distinct forces have separate missions. The mission of the maneuvering force is to close with and destroy the enemy by fire

and shock effect. It will consist of all available tank and infantry units. The mission of the base of fire is to minimize the enemy's capability to interfere with the movement of the maneuver force and, within its capabilities, to destroy the enemy. The base of fire normally *does not join the maneuvering force* in the assault. It may consist of organic mortars, supporting artillery, tactical air, and naval gunfire. Tanks are used in the base of fire when terrain prevents their employment in the maneuvering force.

20. Gaining and Retaining the Initiative

a. The initiative is a condition in which a commander retains the capability to apply his resources at will to influence the action. The commander possessing the initiative is able to take actions that so threaten his opponent that the actions must be countered.

b. Armor commanders seek every opportunity to gain the initiative. Bold and aggressive employment of overwhelming combat power, the achievement of surprise, or the exploitation of enemy errors or weaknesses all serve to gain the initiative.

c. Once the initiative is gained, every effort is expended to retain it. Once lost, the initiative is difficult and costly to regain. The continuous application of force against those parts of enemy units least capable of withstanding attack, the neutralization or destruction of the enemy's means of influencing the situation, and the prompt exploitation of successful actions at all levels all serve to retain the initiative. The initiative is retained by commanders who conduct actions rapidly and decisively and who have alternate plans ready to be implemented.

21. Exploiting Enemy Weakness

Because combat power is relative, armor commanders actively seek to take advantage of any enemy weakness to enhance success—weaknesses from faulty dispositions, poor morale, insufficient support, etc., as well as in numerical strength. Nuclear weapons are a powerful force for creating weakness in enemy dispositions.

22. Mobility

The mobility of armor units must be exploited to maneuver firepower into position to destroy the enemy. Mobility makes possible the achievement of surprise. It permits the rapid concentration and prompt dispersal of combat forces required by nuclear warfare. It makes feasible the assignment of multiple missions and permits the rapid disengagement of committed forces. It permits the concentration of converging forces on a single objective from several directions. Commanders at all levels must anticipate, and plan to overcome or avoid, conditions that inhibit mobility. These conditions are not just terrain obstacles but all restrictions to movement, from fires to the state of materiel readiness.

23. Flexibility

a. The interaction and reaction of events and conditions in mobile warfare make it necessary for combatants to adapt their actions to significant circumstances that may develop.

b. Armor units, by virtue of their organization, extensive communication, mobility, and variety of weapons, are capable of rapid and frequent changes in organization, formation, and direction of movement.

c. Armor commanders at all levels must keep themselves and their superiors abreast of fast-moving situations and be willing to modify their plans to meet significant changes.

24. Combined Arms Forces

a. The versatility of armor operations is realized when combined arms forces are used. The special characteristics of each type unit, tank, infantry, artillery, or engineer, are used to contribute to the success of the force.

b. The proper combination of tanks and infantry supported by engineers and artillery normally makes the most effective force. In this combination, tanks fight mounted while infantrymen fight dismounted. Tank and infantry units are sometimes, by necessity, employed separately. Separation of tanks and infantry should be limited to the time or distance wherein the two are mutually supporting.

25. Deliberate Planning—Violent Execution

Successful armor operations are characterized by careful planning followed by violent execution. Once plans are put into effect, the degree of aggressiveness with which the attack is executed will determine the measure of success. Shock effect cannot be obtained without violent execution. Armor operations involve large spaces, careful timing, and detailed plans for logistical support. They involve careful coordination and teamwork by all units. They require carefully thought-out communication plans. It is desirable that each armor commander be given information as to the intentions of the next higher commander. With this knowledge, he can rapidly direct successive efforts toward furtherance of the overall plan as he finds opportunity to exploit local successes. The commander must plan well ahead to anticipate actions that may be required during the conduct of operations.

26. Orders

Armor commanders make maximum use of fragmentary orders. All orders are designed to tell the subordinate *what* to do but not *how* to

do it. The speed of armor operations and the rapidly changing tactical situation during mobile warfare make it necessary that commanders be allowed as much freedom of action as possible. Only under these conditions can commanders take immediate advantage of favorable changes in the situation.

27. Use of Environment to Best Advantage

a. Armor commanders must seek to use every advantage offered by the terrain, airspace, weather, and time.

b. The cross-country capability of armor units reduces dependence on roads. Armor units seek to capitalize on this capability.

28. Adequate Logistical Support

Adequate and timely logistical support is essential to the successful accomplishment of the tactical mission. Detailed planning for adequate supply, evacuation, and maintenance must precede the operation. During operations, logistical estimates are continual and plans are implemented to maintain the fighting capabilities of combat forces.

Section IV. FACTORS AFFECTING EMPLOYMENT

29. General

a. To be successful, commanders must employ armor in a manner calculated to make maximum use of its favorable characteristics. This calculation is based on a reasoned analysis of certain factors affecting the employment of armor units.

b. These factors are considered within the four paramount groupings of mission, enemy, terrain and weather, and troops available (METT). The tactical environment in which armor units are employed is described under these four groupings. The commander must keep the following factors constantly in mind to make maximum use of his combat power.

30. Mission

a. The mission assigned by higher headquarters guides the employment of armor units. The success of tactical operations is measured by accomplishment of the mission.

b. A mission is a statement of a task and its purpose, which clearly indicates the action to be taken and the reason therefor. Missions will prescribe *what* is to be done but leave *how* it is to be done to the judgment of the subordinate commander.

c. The commander studies the mission to insure that he understands it and to determine tasks that are specifically stated. He must analyze the mission in relation to the other factors affecting employment to deduce requirements and tasks that are not stated specifically but that must be done to accomplish the mission. Other deduced tasks may be determined during the commander's estimate of the situation.

31. Enemy Information

a. *General.* All possible information of the enemy location, strength, disposition, and composition is obtained before the commitment of armor units. The collection of information is

continued throughout the conduct of the operation. All means and sources are exploited to furnish the commander with accurate and timely information so that he may make a continuing estimate of enemy capabilities.

b. Means. The primary means for obtaining combat information available to the armor commander include reports of units in contact, air observers, liaison with adjacent units, organic reconnaissance units, reconnaissance patrols, and intelligence provided by higher headquarters. Combat patrols, or reconnaissance in force may be employed to provide additional information. Any unusual employment of patrols, air vehicles, or reconnaissance in force may risk loss of surprise in the operation.

c. Sources. Sources of enemy information normally available to the commander are prisoners of war, airphotos, and enemy activity. Under some circumstances, refugees or civilians may be reliable sources.

d. Obstacles. Minefields, roadblocks, anti-tank ditches, and other antitank obstacles are constructed to restrict the maneuver of armor units and slow their operation. Knowledge of the existence of such obstacles is of extreme importance. The commander needs to know the location, extent, and strength of obstacles if he is to calculate accurately the measures needed to overcome or avoid them.

e. Nuclear Capability. An enemy capability to employ nuclear weapons must be given serious consideration. This will result in increased attention to passive defense measures such as dispersion, concealment, movement during darkness, cover, stringent traffic control, radio discipline, and individual protective measures.

f. Air. An armor unit will be a high-priority target for enemy tactical air forces. Although armored vehicles are relatively invulnerable to all but direct hits by conventional weapons, as opposed to nuclear weapons, unarmored vehicles organic to armor units are vulnerable to enemy air attack. The employment of all forms of deception, cover, dispersion, concealment, and, particularly, movement is of importance. An enemy capability of employing airborne or airmobile forces must be considered by the commander.

g. Firepower Capability. The enemy capability to counter the employment of armor units is of vital concern and must be considered in the preparation of plans. Factors to be considered in determining his capabilities are—

- (1) Location and disposition of his weapons and their fields of fire.
- (2) Characteristics of his weapons, such as range, rate of fire, mobility, and effectiveness against the various type vehicles being used in the operation.
- (3) Vulnerability of the enemy weapons to the combat power available to the friendly commander.
- (4) Number and type of weapons in possession of and available to the enemy.

32. Terrain and Weather

a. General. The terrain and the weather are important factors in armor operations. The commander makes a thorough analysis of the terrain to determine the advantages it offers and to evaluate the advantages it may afford the enemy. Weather affects virtually all operations, both administrative and tactical.

b. Terrain.

- (1) *Observation and fields of fire.* The effect of observation on both friendly and enemy operations is considered. High ground that affords line-of-sight observation is of particular importance. The commander employs all observation means, including visual and electronic, ground and air, to keep the enemy under constant surveillance. Good fields of fire are essential for the effective employment of direct-fire weapons. Fields of fire are analyzed in connection with the nature of the weapons and the nature of the targets.
- (2) *Obstacles.*
 - (a) The effect of obstacles, either in hindrance or support of operations, is considered.
 - (b) Obstacles may be natural terrain features, manmade obstructions, or obstructions created by chemical and nuclear fires.

- (c) Obstacles may be used by both friendly and enemy forces to strengthen a defense, to deny use of key terrain for observation and defensive positions, to assist in economy-of-force measures, and to protect the flank of a moving force.
 - (d) Nuclear weapons can create the following obstacles: induce and fallout radiation; cratering; rubble; fires; or tree blowdown. The obstacle-creating effect must be considered when nuclear weapons are used.
- (3) *Concealment and cover.* Concealment is protection from observation. Cover is protection from fire. Every advantage afforded to friendly forces by the terrain and conditions of visibility to provide concealment and cover must be exploited. Concealment and cover are essential in masking assembly of troops, for protection against all types of fires, and in aiding in tactical cover and deception measures. Natural and artificial camouflage, smoke screening, and natural and manmade areas may be used to conceal and cover forces. Measures to counter advantages afforded the enemy by cover and concealment must be considered.
- (4) *Key terrain.* Key terrain is any locality or area the control of which affords a marked advantage to either combatant. Key terrain must be seized, neutralized, or otherwise controlled to deny its use by the enemy or permit its use by friendly forces.
- (5) *Avenues of approach.*
- (a) Possible avenues of approach are analyzed based upon the availability of observation, concealment and cover, fields of fire, space for dispersion and maneuver, and trafficability. The obstacle-producing effects on avenues of approach by nuclear weapons must be considered.
 - (b) In analyzing approach routes for airmobile operations, the major concern is achieving or avoiding tactical surprise. Favorable routes

provide defilade and ease of navigation. Heavily forested and swampy areas provide good routes, as ground troops have little opportunity to see or fire at low-flying helicopters. Ridges reduce the possibility of detection by radar. Steep defiles or canyons are avoided because of the possible effects of downdrafts on control of air vehicles.

- (c) All avenues of approach are considered; use of less obvious or desirable avenues of approach may achieve a degree of surprise that offsets disadvantages.

c. Weather. Weather conditions have an important bearing on any decision and should be a primary consideration in operational planning. The primary effects are on visibility and trafficability. The basic meteorological elements affecting operations are wind (speed and direction), temperature, humidity, cloud cover, precipitation, and atmospheric stability (inversion, lapse, and neutral conditions). The forecast, which includes such items as sunrise, sunset, moonrise, and moonset should be considered. Weather conditions may prohibit or limit some phases of an operation. In the planning of operations, adverse weather conditions should be considered; often the success gained during unfavorable weather offsets the limitations and difficulties imposed by soil trafficability and slow rate of movement. Weather factors are of special importance in the conduct of offensive or defensive operations that include nuclear, chemical, or biological employment. Fallout, induced radiation, and chemical and biological cloud travel are greatly influenced by weather conditions. Detailed information is contained in FM 3-5, FM 3-12, and TM 3-220.

33. Troops Available

a. No realistic plans can be made or actions taken that do not consider the capabilities of the forces available.

b. The capabilities of a force are dependent on—

- (1) Number of units.
- (2) Type of units.
- (3) State of training.
- (4) Morale.

- (5) Strength in men and equipment.
- (6) Previous, present, and contemplated employment.
- (7) Location and disposition.
- (8) State of maintenance and supply.
- (9) Adequacy of combat support and combat service support.
- (10) Personalities of commanders.

Section V. ORGANIZATION FOR COMBAT

34. General

The term *organization for combat* describes a concept of forming an appropriate combination of various types of combat and combat support units for a specific mission or task. For the use of the concept by the armor commander, see paragraph 45. Tank and mechanized infantry battalions are normally attached to brigades. The brigade commander may employ the attached battalions without attachment, or he may organize them for combat by cross-attachment. Similarly, tank and rifle companies normally operate directly under control of one of the battalions. The battalion commander may employ his companies without attachment, or he may organize them for combat by cross-attachment. The armored cavalry squadron normally operates under the control of division or its parent armored cavalry regiment.

35. Battalion Task Force

a. A battalion task force is a temporary grouping of combat units, formed to provide the battalion commander with the number and type of units necessary to accomplish a specific mission or task. A battalion task force normally consists of a tank or mechanized infantry battalion headquarters and headquarters company and one or more organic and attached companies. Combat support units are attached or placed in support of the battalion task force as required.

b. There is no definite rule to determine the size and composition of a battalion task force; it is based on a consideration of the factors of METT. In this regard, the battalion task force is similar to the brigade. Units required are attached, or placed in support, in sufficient numbers to carry out the assigned missions. The composition of a battalion task force can be readily changed to meet varying tactical situations.

c. A task force organized around a mechanized infantry battalion headquarters is normally infantry-heavy or balanced. Likewise, a task force using a tank battalion headquarters is normally tank-heavy or balanced. (A battalion task force is balanced when it contains rifle companies and tank companies in equal number, infantry-heavy when it contains a preponderance of infantry companies, and tank-heavy when it contains a preponderance of tank companies.)

36. Company Team

a. A company team is a tactical grouping of combat units under one company commander formed for a specific operation or mission. The company team normally consists of a complete company with 1 or more nonorganic combat units attached, or a company minus 1 or more organic units with 1 or more nonorganic units attached.

b. In the battalion task force, the task force commander may organize company teams. The ratio of tanks to infantry in a company team varies with the factors of METT. Tank and infantry units are usually employed together; if they are not together, they should be mutually supporting by fire or maneuver.

c. Platoons normally are employed as a part of the company team. Typical exceptions would be patrol, reconnaissance, or direct-fire support missions. The platoon usually is the smallest armor units to be attached to another organization.

37. Command of Battalion Task Forces and Company Teams

In the formation of combined arms forces, a unit attached to another becomes subordinate to the unit to which attached. In the determination of the attachment and the extent of the command relationship, the commander ordering the attachment considers—

- a. The mission of the force.
- b. The composition of the force.

38. Subordinate Elements of Company Teams

The tank and rifle platoons normally are commanded directly by the team commander. Normally, a platoon leader will not command any platoon other than his own. Coordinated action between platoons of a company team is attained by orders to each platoon leader from the team commander and by cooperation between the platoons. If it is deemed necessary to place two platoons under a single commander, the company executive officer may be designated to command them.

39. Mortar and Davy Crockett Platoon

The platoon is normally employed under battalion control (general support). On occasion, the platoon, or mortar squads or Davy Crockett section may be given a mission in which control is retained at battalion, but the platoon, squads, or teams are positioned to fire in support of a particular company team (direct support). The platoon or its mortar squads and Davy Crockett section are rarely attached to company teams.

40. Armored Cavalry Platoon

The armored cavalry platoon organic to the combat maneuver battalions is normally employed on reconnaissance and security missions under battalion control. The platoon or its elements are rarely attached to company teams.

41. Armored Cavalry

The attachment of combat or combat support units to armored cavalry units is referred to as reinforcement. The type and amount of reinforcement are based on an analysis of the factors of METT.

42. Considerations of METT in Relation to Organization for Combat

a. Mission.

- (1) Missions requiring wide ranging or rapid maneuver favor tank-heavy forces.

- (2) Missions requiring close and detailed organization of terrain favor infantry-heavy forces.
- (3) Missions requiring semi-independent operations of a subordinate unit favor an organization for combat that provides for as much self-sufficiency as possible.
- (4) Counterattack missions favor tank-heavy forces.

b. Enemy. Action against—

- (1) An enemy protected by strongly organized antitank defenses or by obstacles favors infantry-heavy forces.
- (2) The anticipation of encountering enemy forces in a meeting engagement favors tank-heavy forces.
- (3) An enemy conducting a hasty defense or a retrograde action favors a tank-heavy force.
- (4) An abundance of enemy automatic weapons and massed indirect fires favors tank-heavy forces.
- (5) A vague enemy situation favors tank-heavy or balanced forces.
- (6) An enemy capability for using strong tank forces favors tank-heavy or pure tank forces.

c. Terrain and Weather.

- (1) Conditions that provide good observation and long range fields of fire favor tank-heavy forces.
- (2) The presence of obstacles, other than chemical or radiation obstacles, favors infantry-heavy forces.
- (3) Tank-heavy forces require trafficable terrain.

d. *Troops Available.* The discussion of troops available in paragraph 33 is a consideration primarily of those factors that determine the feasibility of different organizations for combat.

Section VI. PLANNING ARMOR OPERATIONS

43. General

The tempo of events in mobile warfare and the rapid fluctuations in tactical situations place a premium on time. The successful commander makes sound and timely decisions. He is assisted by his staff in developing a plan to implement the decision and an order to disseminate the plan to subordinates.

44. The Decision

a. The decision is the result of a reasoned analysis of all factors affecting the employment of units in combat. The steps to be considered and their sequence are contained in the estimate of the situation (app. VII). It must be emphasized that, because of rapidly changing situations, estimates are normally accomplished mentally.

b. The decision encompasses the following as a minimum. Some items may be fixed by order of higher headquarters.

- (1) WHO (the unit to take some action, the command as a whole).
- (2) WHAT (the type action to be taken; attack, occupy, delay on successive positions, etc.).
- (3) WHEN (time the operation is to start or end).
- (4) WHERE (the area from which, through which, or to which the action will be accomplished).
- (5) HOW (statement of the scheme of maneuver, organization for combat, and plan of fire support).
- (6) WHY (statement of the purpose, which includes details necessary to insure intelligent preparation and execution of the plan).

45. The Concept

a. The concept is an elaboration of the decision and is used for two purposes—

- (1) To announce the concept to individuals who will prepare the plan to execute the decision. It will be as detailed as necessary to insure that plans are developed in accordance with the commander's desires.

- (2) To form the basis of the concept of the operation stated in paragraph 3a of the operation order. For a discussion of the concept in this form see appendix IX.

b. The commander's concept may include, among other things—

- (1) *Type of operation* (penetration, envelopment, delay on successive positions, mobile defense, reconnaissance in force, screen, and covering force).
- (2) *Area of operation* (avenue of approach, sector of defense, flank to be secured).
- (3) *Scheme of maneuver* (formation for the attack, disposition of forces for defense and delaying action, organization for combat).
- (4) *Purpose of the operation* (to destroy the enemy in position to be able to continue the attack, to block enemy movement, to determine enemy strength and dispositions).
- (5) *Purpose of the reserve* (number of units and their organization for combat, general location, and anticipated employment).
- (6) *Preparation for future operation* (changes in organization for combat, positioning of units, or order of march; special efforts to support future operations).
- (7) *Special instructions* (security measures, employment of combat and combat support units, use of air vehicles).
- (8) *Control measures* (objectives, phase lines, boundaries, axis of advance, delay lines, blocking positions).
- (9) *Nuclear weapons* (use in scheme of maneuver, restrictions on use, allocations).
- (10) *Troop safety*. This is expressed as the degree of risk to troops that the commander is willing to accept to accomplish the mission.
- (11) *Priorities* (priorities of fire, combat service support priority).

- (12) *Any departure from standing operating procedure* (a change in the amount of combat rations carried, a change in the employment of the trains).

46. The Plan

a. A plan is a method or scheme for a military action. It is a proposal to carry out a decision or project of a commander. As discussed in this section, it is a part of the planning process in preparation for an armor operation.

b. A good plan should—

- (1) Be capable of accomplishing the mission.
- (2) Be based on facts. The facts influencing planning are discussed in paragraphs 34 through 42, under METT.
- (3) Use existing resources. All means of applying or supporting combat power must be included. The use of these means is planned so that all resources contribute to the accomplishment of the unit's mission.
- (4) Provide the necessary task organization. The organization for combat decided upon by the commander must be translated into the specific terms of task organization. For example, a decision to attack with a tank-heavy unit must be converted into the specifics as they will appear under "task organization" in the order. This will be a determination of what unit will be the nucleus, how many subordinate elements should remain under the unit's control, how many elements will be attached, what unit or units will these elements be detached from, and when the attachments will be effective. Command relationships and responsibilities must be indicated in the organization for combat.
- (5) Provide continuity. The plan must make all necessary arrangements for the full period of the operation. Arrangements should be made in detail as far in advance as the events of the operation can be foreseen. This includes such items as displacement of

supporting weapons, command post facilities, and trains.

- (6) Provide decentralization. Subordinates should be allowed maximum freedom in the discharge of their responsibilities consistent with the necessity for coordinating their efforts. As a planning technique, the planner normally visualizes the action of units *two* levels below his own. This technique must not be carried over into the order. Adherence to the fundamental of using mission-type orders will require that the planning develop *what* subordinates are to do without specifying *how* they are to do it.
- (7) Provide control. All actions and efforts must contribute to the accomplishment of the mission. Even though the armor commander desires to permit maximum freedom of action of his subordinates, he must still plan to control and direct their efforts toward a common goal, the accomplishment of the mission. For overlay techniques used to express the commander's desires concerning controls, see appendix X.
- (8) Be simple. Plans may, of necessity, be detailed, but should avoid complexities. The planner strives for simplicity of execution. As an example, committing a following unit around a leading unit is normally simpler than committing it through the leading unit.
- (9) Be flexible. Planners strive for flexibility in plans. One reason why unnecessary restrictions are not imposed on subordinates is that the exercise of initiative at all levels adapts the conduct of operations to circumstances. Other parts of the plan that may contribute to flexibility are the composition and location of a reserve, the use of balanced task organizations, and the preparation of alternate plans.
- (10) Be coordinated. All aspects of the plan that affect units or support agencies not under control of the unit must

be coordinated to prevent conflict of action.

c. The two basic elements of the plan are the scheme of maneuver and the plan of fire support. They are developed together and are so interrelated that they are normally referred to by a single name: plan of attack or plan of defense.

d. The overall plan is made up of many parts of supporting plans. To insure that this overall plan is complete and that each part contributes to it, a basis for planning must be used. The basis is the scheme of maneuver—the employment of the basic maneuver units, and the plan of fire support—the employment of fire support units. Specific plans developed to support the scheme of maneuver and plan of fire support may be as follows:

- (1) Employment of organic or attached indirect-fire weapons is usually coordinated into the plan of fire support.
- (2) Plan of employment of organic or attached reconnaissance and security units is based on their capabilities and the requirements of the situation.
- (3) A communication plan is prepared to support the commander's concept and overcome difficulties that might interrupt communication. All means are considered and alternate plans are developed. The movement of any command facilities is a major factor in the communication plan.
- (4) A plan to insure adequate logistical support is required for sustained armor operations. All organic, attached, and supporting logistical means are integrated into a single effort aimed at maintaining the combat power of the unit. This logistical plan encompasses supply; transportation; maintenance; medical evacuation and hospitalization; battlefield recovery, evacuation, and salvage; and services.
- (5) A plan for maintenance of unit strength; morale and personal services; graves registration; discipline, law, and order; and handling of enemy prisoners of war.
- (6) The presence of civilians in the area of operations will require plans for their control.
- (7) Area damage control plans are made to minimize the effects of massive damage to or contamination of the unit.
- (8) Provisions for rear area security are made to secure the unit against hostile infiltrators, guerrillas, and airborne or airlanded forces.
- (9) A plan for the employment of attached or supporting engineers. Engineer support is most effective when control of the engineer work effort is under central control and thus best uses the engineer resources of the unit.
- (10) SOP's specify many routine procedures and actions to be taken within the unit during operations. Any departure from such procedure or actions will require a stated change to the SOP. Newly assigned personnel must immediately become familiar with the SOP.
- (11) Intelligence plans are required in order to make maximum use of means and to insure that no sources of information are overlooked. The employment of all surveillance means must be integrated into a single overall effort that best contributes to the accomplishment of the unit mission.
- (12) Employment of nuclear weapons must be planned and coordinated carefully with other plans. The commander must weigh carefully the degree of risk he will accept in order to accomplish his mission without undue exposure of his men.
- (13) Weapons such as flamethrowing tanks, or special transportation means, such as helicopters for airlanding, are usually integrated into the scheme of maneuver. The employment of this equipment may require other supplementary plans, such as an airlanding plan or a loading plan.

(14) Illumination means, other than those delivered from weapons, are integrated into the scheme of maneuver and coordinated with the plan of fire support.

(15) Movement plans may be required in preparation for an operation. The specific plans required will depend upon the type of transportation available.

(16) Certain operations may require special training or rehearsals. Plans to accomplish necessary training must make best use of the time available.

47. Order

The plan is expressed to subordinates by means of an order. For format and techniques used in preparing the order, see appendixes IX and X.

Section VII. CONDUCT OF ARMOR OPERATIONS

48. General

Armor operations are conducted by fire and maneuver, combined and controlled to create a preponderance of combat power that culminates in a powerful and violent action at the decisive time and place. Commanders avoid rigid adherence to the original plan in the face of significant changes in the situation that provide opportunities to destroy the enemy. The cross-country mobility, firepower and communications of armor units allow the armor commander to rapidly mass or disperse his combat power for the accomplishment of any given task. The armor commander seeks every opportunity to employ his combined arms force in mass and thus bring maximum combat

power to bear against the enemy. Every effort is made to gain knowledge of the enemy before, during, and after engagement. Commanders and leaders at all levels must make continuous estimates and react rapidly to changes in the situation. Armor operations are mobile in nature, violent in action, and calculated to obtain decisive results.

49. Type Operations

The basic doctrine discussed in paragraph 48 is employed by the armor commander at every opportunity regardless of the type operation he may be conducting. The techniques used in the conduct of offensive, defensive, retrograde, reconnaissance, security, and other operations are discussed in specific chapters.

Section VIII. CONTROL

50. General

Success in mobile warfare demands effective control of the combat power available to armor commanders. Control as discussed in this section concerns all means available and used by the commander to enhance unit responsiveness. It also involves attitudes of the commander and his staff as to freedom of action of subordinate commanders in combat operations. Cooperation on the part of subordinate commanders also increases control. Control involves—

- a. Effective orders.
- b. Adequate control facilities.
- c. Proper organization for combat and use of formations and terrain.
- d. Responsive, informed subordinates.

51. Orders

a. Orders contribute to control of a unit by their clarity and timeliness. To be effective, orders must clearly express the wishes and intentions of the commander.

b. For a detailed discussion of orders see appendix IX.

52. Control Facilities

a. Keeping abreast of the situation assists the commander in maintaining control of the unit. To do this he must receive reports from subordinates (subordinate commanders and staff officers), higher headquarters, and adjacent units. He must be aware of the situation and condition of his subordinate units, and be

cognizant of the mission and general situation of his superior headquarters.

b. The primary means employed by the commander are—

- (1) *Communication.* All forms of signal communication must be used to the best advantage. Great reliance is placed upon radio. Maximum use is made of ground and air radio relay and wire is used to supplement radio when practical.
- (2) *The command post.* The command post is the principal facility from which the commander exercises command. For further details, see appendix II.
- (3) *The command group.* When the situation requires, the commander accompanied by selected staff officers, may locate himself away from the command post (CP) to better control operations. This group is small and mobile and normally operates for relatively short periods. For further discussion of the command group, see appendix II.
- (4) *Alternate control means.* Normally, alternate CP's are not established at brigade level or lower. Subordinate headquarters are designed as successor headquarters. However, in certain situations, a requirement for an alternate command post at brigade and battalion level may exist. In this event, additional equipment, particularly communication equipment, may be required.
- (5) *Movement of the command post.* Movement of the command post should be planned so as to cause minimum interference with normal operation. A quartering party with communication facilities may move to the new command post location and establish communication and conduct operations while the command post displaces.
- (6) *Liaison.* The brigade and battalion commander must make maximum use of their liaison officers to establish

contact with higher, lower, adjacent, or supporting headquarters and subordinate units to insure mutual understanding and unity of action. These liaison officers generally perform the following duties:

- (a) Before departing on their liaison mission, they thoroughly familiarize themselves as to the situation, future plans, and new policies of their unit.
- (b) They coordinate with the staff to determine areas for coordination.
- (c) On arrival at the headquarters to which sent, they report to the commander or appropriate staff officer; pass on information and orders as required; and become familiar with that unit's situation and plans that they are to transmit to their own unit.
- (d) While moving between headquarters, liaison officers should observe all locations of troops and command posts and other actions of interest to their commander not otherwise obtained by liaison visits.

53. Organization for Combat and Formations

a. The commander exercises control of his unit through proper organization for combat and the use of formations. Combat, combat support, and combat service support units are grouped to best accomplish the mission. Organization for combat has two necessary functions: it combines resources to accomplish each part of the mission and it provides the means to insure adequate command and control of these groupments by the commander. Organization for combat is discussed in paragraph 34 through 42.

b. Formations are determined based on an analysis of METT for the purpose of directing the combat power of the unit in the most effective manner determined to accomplish the mission. The successful employment of the unit in another posture requires not only the issuance of a clear order, but responsive execution of the order by subordinates. Formations and

terrain which facilitate rapid shifts in the deployment of the unit assist control.

c. For a detailed discussion of formations in various types of operations, see appendix XII.

54. Subordinates

a. Subordinates must be responsive to the will of the commander. This means prompt reaction to orders or to changes in the situation. Mobile warfare demands the utmost in commanders or other persons in responsible positions. The flexibility of armor operations de-

pends on the mental flexibility of all soldiers in the operation.

b. To encourage this mental flexibility and to foster the sense of teamwork that contributes to his control of the unit, the commander will keep his subordinates fully informed of his concept of the operation and the situation as it develops.

c. Subordinates keep the commander informed. Control of the unit depends on the timeliness and accuracy of these reports.

CHAPTER 3

COMMAND

Section I. COMMAND AND LEADERSHIP

55. General

a. The primary objective of armor tactical command is success in combat. This requires the development, integration, and employment of the unit's ability to move, shoot, and communicate. In preparing for armor command, the armor leader must understand thoroughly the tactical and technical employment of his unit, and the operations and employment of normal supporting or attached units. In combat operations, the armor commander normally commands a combined-arms force.

b. In cold war operations, particularly those involving deployment in oversea areas, the commander must have a thorough understanding of the people with whom he deals, and the ability to adapt his concepts and thinking to the limitations that may be imposed on the use of his force, political or otherwise.

56. Armor Commander

a. *Responsibilities.* The armor commander is responsible for the training of his unit, its actions in combat, the health and well-being of its personnel, its supply, and the maintenance of its equipment. In short, he is responsible for all that his unit does or fails to do. To discharge these responsibilities efficiently, he must train and use his subordinate commanders and staff officers to the fullest. To encourage ingenuity, initiative, self-reliance, and aggressiveness, he should indicate his policies to his subordinates and then allow them maximum freedom of action.

b. *Command.* The armor commander makes decisions, which are transmitted as orders. To insure that they are understood and executed satisfactorily, he continually supervises and checks on the execution of all orders issued. The armor commander will normally receive his orders from the next higher headquarters;

however, in the absence of such orders, he must be prepared to take action on his own.

c. *Relations with Subordinates.* The armor commander's relationship with his subordinates should be direct and personal. He must keep them informed of the situation and of his desires. He should encourage them to deal directly with him whenever they feel that such action is desirable. He should frequently visit subordinate units to obtain firsthand information and to foster esprit de corps; this is particularly desirable in the case of newly attached units. Attached or supporting unit commanders advise and assist the armor commander in technical matters pertaining to the employment of their units.

d. *Command Supervision.* Supervision is the most difficult part of the order-execution pattern. The commander must use his subordinates to the fullest extent during supervision. Supervision includes but is not limited to—

- (1) Questioning subordinates and assistants to determine understanding of tasks to be accomplished.
- (2) Insuring that policies and orders be carried out in the highest military tradition.
- (3) Making personal visits to subordinates to observe, offer advice, and make corrections when necessary.
- (4) Encouraging initiative and creative thinking. Oversupervision will stifle these.

57. Succession of Command

a. The nature of armor operations requires a clearly understood procedure for succession of command upon the sudden loss of the commander. The succession of command should be defined clearly, either through orders or in the unit SOP. As a fundamental of leadership, each

commander must train and use his subordinates so that a smooth and efficient transition of command is insured. With few exceptions, succession of command should be vested in the next senior in rank. Under exceptional circumstances, a subordinate other than the next senior in rank may assume temporary command.

b. The delegation of authority is a function of command. This is especially important during periods in combat when contact with the commander is temporarily lost. The armor commander should provide adequate guidance as to his concept of operations and should delegate sufficient authority to permit his key subordinates to exercise command in his name during periods of temporary loss of communication. Responsibility cannot be delegated.

58. Responsiveness to Command

Armor commanders are responsive to command. They are capable of accepting a mission-type order, understanding it clearly, and taking immediate action to execute the order. Responsiveness to command is achieved by fully understanding and exploiting the extensive and flexible communication systems of armor units. It is also accomplished through a combination of the mental mobility of the commander and the mobility and flexibility of the unit. It enables the armor unit commander to direct the employment of organic, attached, and supporting units with speed, accuracy, and efficiency.

59. Leadership

a. The primary duty of the leader is the accomplishment of his assigned mission. Everything else is subordinate to the mission. The leader briefs, instructs, and trains his men so that the mission is accomplished. The welfare of his men is the leader's second most important responsibility. See FM 22-100 for a detailed discussion of leadership.

b. Leadership of armor units presents difficult problems. For example, the armor leader must convince his unit that being completely separated from other friendly units and operating well within enemy-held terrain, is a normal armor operation. Problems of maintenance

and supply for both personnel and equipment assume major proportions in armor warfare.

c. Welfare is concerned with the physical and moral needs of the command. The commander avoids coddling his men for the same reason that he avoids pampering himself. Coddling soon blinds a unit to the distinction between real needs and luxuries. As a result, when the demands of a mission require the sacrifice of luxuries, morale and esprit de corps suffer needlessly. Techniques used by the commander to improve the welfare of his men are—

- (1) Being approachable.
- (2) Developing an intimate knowledge and understanding of subordinates.
- (3) Maintaining an interest in living conditions of members of the command, including their families.
- (4) Providing for recreation, personnel services, and religious services.
- (5) Protecting the health of the command by active supervision of hygiene and sanitation.
- (6) Administering justice impartially.
- (7) Insuring a fair leave and pass policy.
- (8) Sharing the problems of the members of the command so as to better understand them.

60. The Human Factor

a. The individual soldier of an armor unit must be indoctrinated with the spirit of the offensive. His thinking must be geared to the speed and violence of armor warfare. He must be trained to operate deep in hostile territory, and to recognize that the presence of the enemy to his front, flanks, and rear is a condition to be expected.

b. Armor leaders operate with their forward elements. They must possess mental mobility and be responsive to command. They must know and follow sound troop leading procedures. They must be alert, aggressive, and decisive in the selection and pursuit of a suitable course of action to surmount the varied and complicated problems that will confront them.

Section II. TROOP LEADING PROCEDURE

61. General

a. Troop leading procedure describes the sequence of actions and thought process a leader follows while preparing for and executing assigned missions. He must make the best use of time, equipment, and personnel.

b. The sequence of troop leading procedure may vary depending on the size and type of unit, nature of the mission, and time available. Certain procedures may be undertaken concurrently, and some are considered continuously, throughout an operation. Regardless of the technique used in troop leading procedures, the commander must make an estimate of the situation.

c. Time is one of the leader's most important considerations. Leaders must allow their subordinates maximum time for planning. If subordinates do not have enough time to make adequate preparations, even the most brilliant plan cannot be executed properly. On the other hand, a plan conceived in undue haste places a great burden on the combat soldier. Therefore, the armor leader allocates the time available for troop leading procedure, consistent with the situation, to prepare and execute his mission.

62. Sequence of Troop Leading Procedure

a. The sequence of troop leading procedure is—

- (1) Receipt of mission.
- (2) Warning order.
- (3) Estimate of the situation.
- (4) Tentative plan.
- (5) Reconnaissance.
- (6) Decision and completion of plan.
- (7) Order.
- (8) Supervision.

b. Upon receipt of a mission, the commander analyzes this mission to determine tasks necessary to accomplish it. He issues a *warning order* to his force including as much information as is available. He then begins his opening or initial *estimate of the situation* based upon all information available at the time. He arrives at a *tentative plan* and, based upon this plan, conducts his *reconnaissance*. He may at

this point revise his plan or continue with his *completed plan or decision*. He then issues his *order* and *supervises* to insure that it is carried to a successful conclusion.

63. Techniques of Troop Leading Procedure

a. *Receipt of Mission.*

- (1) Analyze the mission to insure a complete understanding of the assigned mission and to determine what tasks must be performed to accomplish it. Ask questions of the commander for any points not understood.
- (2) Plan the use of available time. Allocate enough time to subordinates to perform their troop leading procedures.

b. *Warning Order.* Subordinates are alerted that some action will be required. The warning order allows units to make such preparations that do not depend on specific orders, such as performing maintenance, boresighting weapons; checking radios and individual equipment; and distributing ammunition, fuel, rations and other supplies. These tasks are supervised by the platoon sergeant, platoon leader, and vehicle commanders. The desirable minimum elements of a warning order are—

- (1) *Addressee.* The warning order is relayed down the chain of command to every soldier.
- (2) *Nature of operation.* If security conditions permit, at least the general nature of the operation should be disseminated.
- (3) *Time of action.* If known or if it can be estimated, knowledge of this element will assist subordinates in their preparations.
- (4) *Time and place of the issuance of the complete order.* This element, if known or anticipated, should be disseminated.

c. *Estimate of the Situation.* The purpose of the estimate is to arrive at a decision through a logical and orderly examination of all factors affecting the accomplishment of the mission. The estimate of the situation is opened by the

initial evaluation of information available. As an example, information of the terrain may be gathered from a map reconnaissance as a minimum. The estimate is progressively refined as more information becomes available. The estimate is a continuous process of evaluation before and throughout the operation. For a further discussion of the estimate, see appendix VII.

d. Tentative Plan. Based on the decision as a result of the initial estimate, the leader makes a tentative plan, which guides his actions and the actions of his subordinates, and, at the appropriate levels, serves as a basis for staff planning. The tentative plan and tentative decision may be modified after coordination and reconnaissance and before the final decision. At this point in troop leading procedure, the tentative plan serves as a basis for the following:

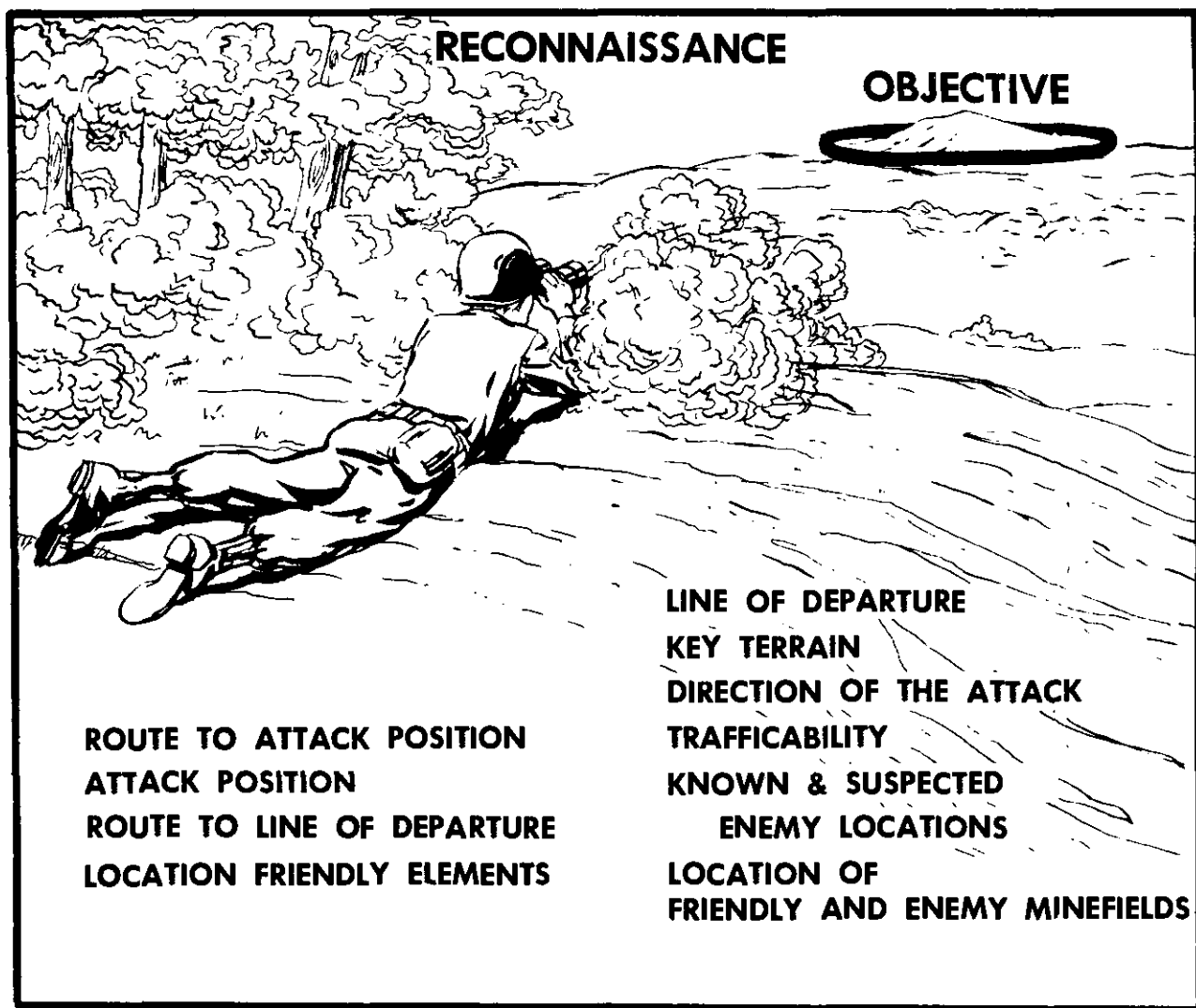
- (1) *Coordination.* Coordination is made with all units or agencies that might be affected by the impending action. The leaders of some of these units may have been present when the order from higher headquarters was received. If so, coordination should be accomplished at that time with combat support representatives, that is, artillery, mortars, and engineers. The coordination is an exchange of information on plans of operations to insure that there is no conflict between units.
- (2) *Movement of the unit.* Arrangements for movement of the unit are made, if required. The tentative plan will contain at least initial plans for a task organization to implement the organization for combat decided upon. The movement and "marrying up" of the units affected by the planned cross-attachment should be planned at this time. Movement plans are as detailed as necessary to accomplish the purpose, and normally include who is to move, where they are to go, and when the move is to be made.
- (3) *Planning the reconnaissance.* The reconnaissance must be planned to make

the best use of time. The plan must include where to go, the sequence of areas or places to be reconnoitered, such as routes to the attack position; attack position; routes to line of departure; line of departure; location of friendly elements and enemy positions, and transportation to be used; persons to accompany the leader; and coordination to be effected during the reconnaissance. Certain persons, such as a weapons platoon leader, armored cavalry platoon leader, or other subordinates, may be directed to make a specific reconnaissance.

- (4) *Plan for time and location for issuance of order.* A plan for issuance of the order must be made. Armor leaders normally issue orders to subordinates at a terrain vantage point. If subordinates cannot be assembled at a single place to receive the order, the plan to issue the order may be a combination of the following techniques:
 - (a) *Radio.* Leader to subordinates.
 - (b) *Personal contact.* Leader to individual subordinate or designated staff officers.
 - (c) *Messenger or other means of communication.*

e. Reconnaissance. On his ground reconnaissance, the leader continues the estimate process, adjusting his courses of action accordingly, and selects the best course of action. He then selects or confirms, as appropriate, such items as objectives, phase line, line of departure, defense areas, routes, weapons position areas, sectors of fire, and targets. He notes the effects of the terrain on his tentative plan, and he rejects, alters, or adopts appropriate parts of this plan accordingly. During his reconnaissance, he coordinates with adjacent and supporting unit leaders as planned.

f. Decision and Completion of Plan. The completed plan is a result of refinements made to the tentative plan. Recommendations from combat support unit representatives, that is, artillery, engineers, or air force, and the results of the reconnaissance serve to give the

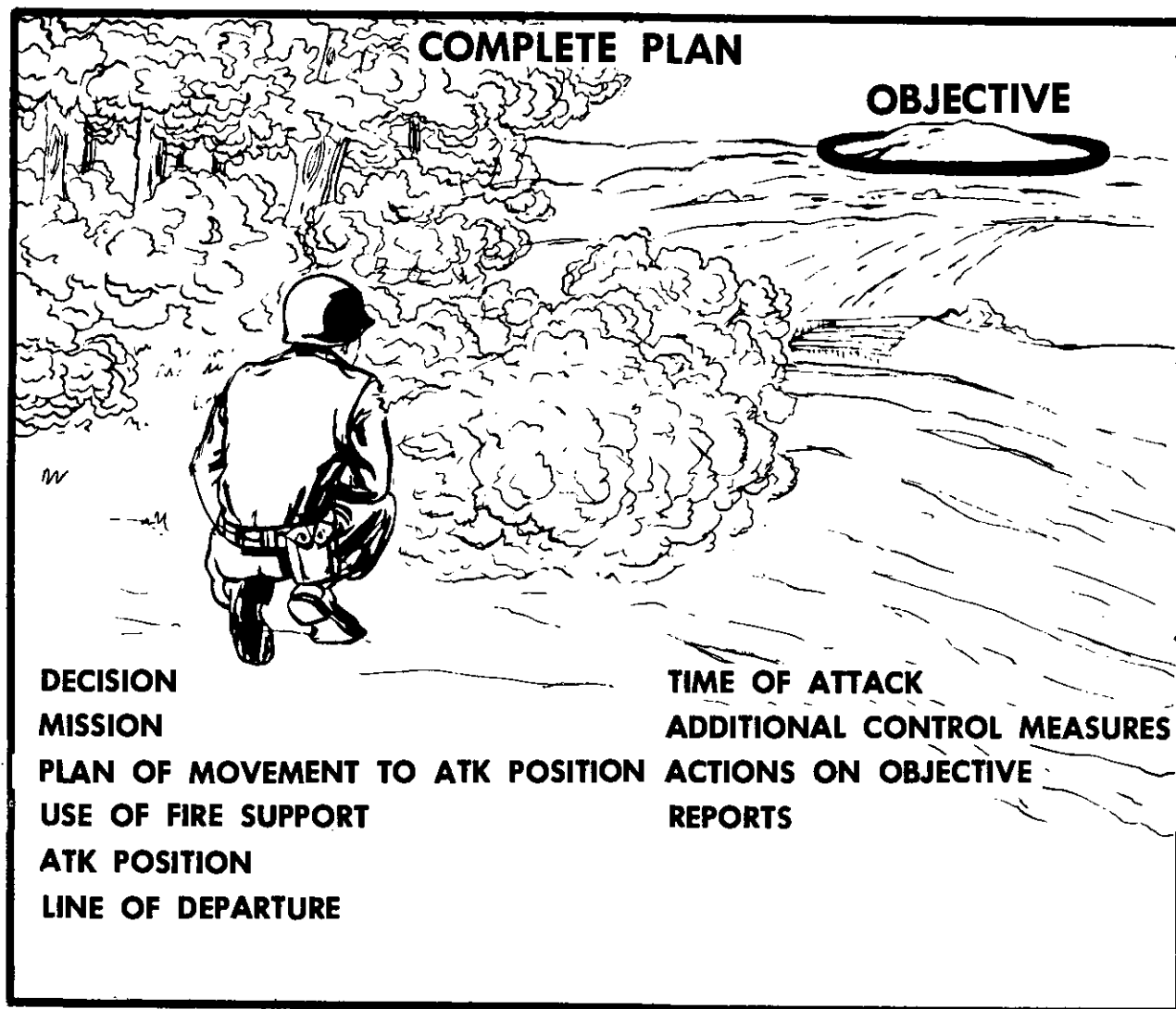


1 Tentative plan.
 Figure 1. Reconnaissance.

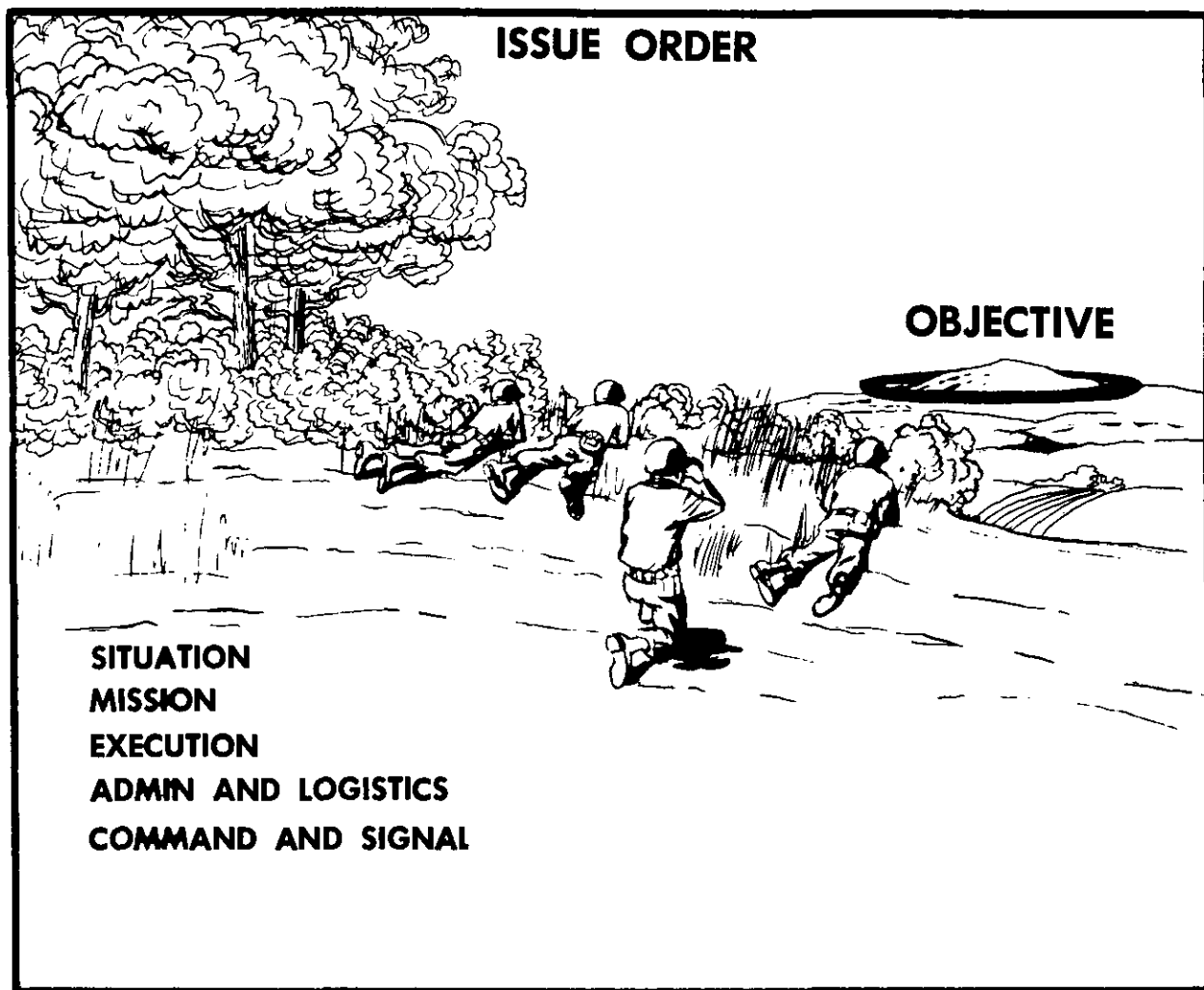
leader the elements necessary to complete the plan.

g. Order. Orders must be clear, concise and as complete as required to insure that the order is understood. It must be delivered in a manner that insures complete understanding of the leader's concept. Subordinates ask questions after the order has been issued.

h. Supervision. The leader, with the assistance of his subordinates, actively supervises his unit to insure that the order is carried out satisfactorily. If he notes a deficiency or a misunderstanding, he takes immediate corrective action.



2 Complete plan.
 Figure 1—Continued.



3 Issue order, clear, concise and complete.

Figure 1—Continued.

CHAPTER 4

THE COMMANDER AND HIS STAFF

Section I. THE COMMANDER

64. General

The commander and his staff are a military entity with one purpose: successful execution of the commander's mission. The commander's mission involves varied and complex problems as reflected in chapter 3. The purpose of this chapter is to discuss the specific duties of the staff to include its actions and relationship with the commander to insure the successful accomplishment of the mission.

65. The Commander's Conduct in Combat

a. The commander uses all available means to accomplish his mission. His plans, orders, and supervision insure that the actions of all units contribute effectively toward that end. When additional units, weapons, or other support is required to accomplish the mission, the commander takes action to obtain it. He coor-

dinates the activities of his command with those of adjacent and supporting units.

b. The commander goes where he can best direct, control, and influence the operation. He may be with the command group element, at his command post, or anywhere else in his area of operations where his presence is required. Before he leaves the command post, he informs his staff on plans to be made or actions to be taken if the situation changes. When he is away, he insures that he can communicate with his command post and subordinate commanders. If, while away from his command post, he issues orders or obtains pertinent information of the situation that has not been made available to the staff, he informs them without delay.

c. The commander influences the conduct of battle by employing supporting fires, shifting maneuver elements, and making his presence felt at critical points.

Section II. THE BATTALION STAFF

66. General

a. A staff officer is an assistant to the battalion commander in the exercise of command. He transmits his commander's orders to unit commanders or conveys his commander's instructions or desires. Staff officers may, when so authorized, issue orders based upon the policies of the commander. Whenever a staff officer issues an order, he informs the commander as soon as possible. The staff assists the commander by relieving him of time-consuming details. The staff keeps its information and estimates current on the strength, location, and action of lower units; enemy capabilities, strength, location, and composition; and the status of logistics and administration. On the

basis of this information, the staff makes recommendations to the commander. When a decision is made, the staff members assist in translating the decision into orders and in supervising their execution.

b. The battalion staff is a closely knit team. The successful functioning of this team depends primarily upon close coordination among its members and between the staff and units of the battalion. This coordination includes teamwork with the staffs of higher and adjacent units. Coordination is developed through understanding, training, and practice. Prompt dissemination of all pertinent information, decisions, and orders promotes the efficiency and teamwork of the battalion. Conferences and personal contact promote coordination and co-

operation. There is some overlapping of duties in the battalion staff sections, and only by coordination and cooperation will contradictions and duplication of effort be avoided. It is essential that staff officers know the duties and responsibilities of other members of the staff so that they may take over such duties in case of emergency. The staff sections should be organized to operate on a 24-hour basis.

c. The staff officer organizes and trains his assistants to function in his absence. Before leaving the command post, he acquaints himself with the general situation, announces his destination and probable hour of return, and determines what assistance he may give to other staff officers.

d. The staff cultivates friendly relationships with the commanders of lower and attached units. A staff officer must remember that he is not the commander but acts only in the commander's name. Commanders of lower and attached units are consulted to determine their needs, and problems. Staff officers visit lower units to get firsthand knowledge of the tactical situation and administrative conditions. Commanders or their representatives are contacted personally as the first and last steps of each visit. When conditions are observed that are contrary to announced policies, they are called to the attention of the appropriate commander. Details that do not require a command decision may be settled with the unit commander at the time of the visit. Concise reports of facts are provided the battalion commander following such staff visits.

e. The functions of staff officers of battalion-size armor units are similar to those outlined for staffs of small units in FM 101-5.

67. Battalion Staff Organization

The battalion staff consists of the unit staff and the special staff.

a. The unit staff is composed of the executive officer, the S1, S2, S3, and S4, and the sergeant major.

b. The special staff consists of the surgeon, the communication officer, the maintenance officer, HQ company commander, chemical NCO, mortar and Davy Crockett platoon leader,

and armored cavalry platoon leader. When combat support and combat service support units are attached to or placed in support of the battalion, the commanders of these units function as special staff officers for their field of interest. For example, the commanding officer of an attached or supporting engineer company also functions as the battalion staff engineer.

c. The fire support coordinator (FSCOORD) is normally the artillery liaison officer from the supporting artillery battalion.

d. The special staff is also found at brigade and has, in addition to the special staff officers indicated in b above, a chemical officer, chaplain, aviation officer, and food service specialist.

68. The Battalion Unit Staff

a. *General.* The functions, procedures, authority, and responsibilities of the staff are contained in FM 101-5. The responsibilities and functions of the unit staff are comparable to those of the division general staff.

b. *The Executive Officer.*

- (1) The executive officer is the principal assistant and adviser to the battalion commander. His functions and responsibilities are similar to those of a chief of staff. He supervises the staff, and represents and acts for the commander during the temporary absence of the latter when directed to do so. He is prepared to assume command of the battalion at any time.
- (2) The executive officer is normally located at the command post, the continuing function of which is his direct responsibility. He and the commander should not be absent from the command post at the same time.
- (3) He supervises the liaison officers and is also the battalion information officer.

c. *The Personnel Staff Officer (S1).* The personnel staff officer performs the functions of the personnel officer of the general-staff-type organization, the functions of the secretary of the general staff, the functions of the commander's personal staff, and the personnel

functions of special staff officers who are not present in the battalion staff, such as the adjutant general, inspector general, staff judge advocate, provost marshal, and special services officer. His major areas of responsibility for staff supervision are—

- (1) *Maintenance of unit strength* to include but not limited to—
 - (a) Preparation of loss estimates.
 - (b) Maintenance of personnel records and reports reflecting the status of personnel matters in the command.
 - (c) Obtaining replacements (unit and individual) and arranging for their reception, processing, assignment, and quartering.
- (2) *Personnel management* to include but not limited to—
 - (a) Classification, including promotion, demotion, and awarding and changing of MOS's.
 - (b) Assignment, including reassignment, transfer, reporting and requisitioning of personnel.
 - (c) Reenlistment.
 - (d) Preparation and processing of reports on casualties and prisoners of war.
 - (e) Administration of civilian employees operating with the battalion or in the battalion area.
 - (f) Arrangements for the collection and evacuation of prisoners of war in coordination with the S2 and S4.
- (3) *Development and maintenance of morale* to include but not limited to—
 - (a) Personnel services, including leaves of absence, awards, and decorations.
 - (b) Operation of the battalion postal service.
 - (c) Recovery and disposition of the dead.
 - (d) Coordination of recreation for battalion personnel and evaluation of morale.
- (4) *Maintenance of discipline, law and order* to include but not limited to—
 - (a) Recommendations to the commander measures that will maintain or improve discipline within the battalion.

(b) Maintenance of records on military justice procedures and assistance in the review of courts-martial proceedings from an administrative viewpoint.

- (5) *Headquarters management* to include but not limited to—
 - (a) Operation of the headquarters communication control, distribution centers, and messenger service.
 - (b) Internal arrangement of the command post and establishment of a standing operating procedure to guide its operation.
 - (c) Assignment of shelter and quartering areas.
- (6) *Miscellaneous*. The S1 is responsible for all administrative matters not assigned another staff officer.

d. The Sergeant Major.

- (1) The sergeant major is the senior non-commissioned officer in the battalion. He acts as the commander's representative in dealing with other non-commissioned officers, and is his non-commissioned officer adviser in enlisted personnel matters. He establishes direct contact with the first sergeants, personnel staff noncommissioned officer of organic units, and first sergeants of attached units. He holds periodic meetings with them to disseminate information and instructions from the battalion commander. He assists in inspections of activities as prescribed by the commander. He accompanies the commander on visits and at ceremonies.
- (2) Other duties and functions of the sergeant major are discussed in FM 17-30, paragraph 12b(9).

e. The Intelligence Officer (S2). The S2 has staff responsibility for intelligence matters. His duties are similar to those of the G2 (FM 101-5). He keeps the commander, staff, subordinate units, and all other interested agencies fully informed of the enemy situation and capabilities, and terrain and weather. Among his duties, he—

- (1) Plans and supervises (in conjunction with S3) the intelligence and counter-intelligence training of the battalion.
- (2) Plans and supervises troop counterintelligence measures in the battalion.
- (3) Prepares and presents the intelligence estimate.
- (4) Prepares the intelligence plan, including the collection plan and orders and requests to collecting agencies, and coordinates subordinate collecting agencies (coordinating with S3).
- (5) Records all pertinent enemy information on the situation map.
- (6) Evaluates and interprets enemy information, and disseminates intelligence information to his commander, the staff, and higher, lower, and adjacent units.
- (7) Examines captured enemy personnel, including civilians (hostile or friendly) who may possess information of immediate tactical value. Examines captured documents and materiel if of immediate tactical value, and expedites the sending of captured materiel, documents, and personnel to higher headquarters.
- (8) Requests and supervises distribution of maps, airphotos, photo-interpretation reports, defense overprints, annotated airphotos and photomaps for the battalion.

f. The Operations and Training Officer (S3).

- (1) The S3—
 - (a) Has staff responsibility for all matters pertaining to organization, training, and tactical operations. His duties correspond to those prescribed for the G3 (FM 101-5).
 - (b) Is the commander's principal adviser on organization of the battalion for combat.
 - (c) Has staff responsibility for civil affairs functions, and staff supervision over civil affairs elements or personnel that may be attached.
 - (d) Has staff responsibility for fire support planning and coordination.
 - (e) Is responsible for planning and supervision of tactical security for the command post.
- (2) Among his *specific* training duties, the operations and training officer—
 - (a) Prepares and has staff supervisory responsibility for the execution of training directives, programs, orders, field exercises, and maneuvers, based on plans approved by the battalion commander.
 - (b) Selects training areas and ranges, and allocates training aids and equipment.
 - (c) Organizes and conducts battalion schools. Based upon the commander's directives, he prepares the program of instruction, selects and trains instructors, and recommends the selection of units or personnel to attend schools.
 - (d) Makes training inspections, and prepares and supervises training tests based on Army training tests.
 - (e) Prepares training records and reports.
- (3) His *operations* duties include the following:
 - (a) Informs his commander and other staff officers of the tactical situation and is prepared to recommend to the commander actions to be taken by the battalion.
 - (b) Studies the situation as affected by the enemy, orders from higher headquarters, actions of adjacent and supporting units, and location and capabilities of the battalion. He studies the effects of casualties and replacements, terrain and weather, and the status of supply and equipment, as they apply to the battalion mission.
 - (c) Maintains up-to-date information on the battalion and friendly units; supervises the posting of friendly and enemy information on the situation map.
 - (d) Recommends the general location of command post sites.

- (e) Plans troop movements, including units involved, formation, and type of transportation required (coordinating with S4). He prepares the march order after the plan of movement is approved.
- (f) Recommends the tactical employment of units after a study of the factors of METT and after conference with other staff officers and unit commanders.
- (g) Recommends tactical and counter-intelligence measures to attain secrecy and effect surprise (coordinating with S2).
- (h) Coordinates with the communication officer in the preparation of the signal communication plan to maintain communication between the battalion commander, battalion headquarters, and battalion units.
- (i) Prepares the battalion operation order for the commander's approval. Some material for inclusion in the order is obtained from other staff officers (S1, S2, S4, and communication officer). Even though the commander normally issues the operation order verbally, a complete order, often in pencil form only, should be written and filed for record. Frequently this is done during lulls in combat after the action involved has been completed.
- (j) Transmits the commander's orders and instructions to organic, attached and supporting units of the battalion.
- (k) Prepares for future operations, guided by information obtained from the commander and S2 and by knowledge of the present situation of the battalion.
- (l) Prepares operational and after-action reports, and recommends training to correct combat deficiencies.

g. The Logistical Officer (S4).

- (1) The S4 has staff responsibilities for logistical matters of interest to the battalion. His duties are similar to those of the G4 (FM 101-5). He

plans, coordinates, and supervises functions pertaining to supply, maintenance, evacuation of casualties, and transportation in the battalion. He keeps informed of the location of logistical installations that support the battalion. He is responsible for preparing the battalion logistical plan.

- (2) For specific duties of the battalion logistics officer, see chapter 6.

69. The Battalion Special Staff

a. The Chemical Representative (NCO). The chemical representative is the principal adviser to the commander and his staff on chemical, biological, and radiological (CBR) warfare. Coordinating with appropriate unit staff officers, he supervises the CBR operational and training activities of subordinate units. In addition, the chemical representative is responsible for the accomplishment of certain CBR functions in the battalion headquarters. Each section of the unit staff coordinates, with the chemical NCO, CBR warfare operations and training that are within its purview. For specific duties and functions see FM 17-15.

b. The Surgeon.

- (1) The surgeon advises the commander on all medical matters, including sanitation, first aid, and health of the command. His duties correspond to those outlined in FM 101-5 for the surgeon.
- (2) He commands the battalion medical section and exercises staff supervision over attached medical units.
- (3) Additional duties and functions are discussed in chapter 6.

c. The Communication Officer. The communication officer—

- (1) Is the commander's principal adviser on battalion communication matters.
- (2) Has duties corresponding to those of the signal officer (FM 101-5).
- (3) Commands the battalion communication platoon.
- (4) Has staff supervision responsibility for the communication training conducted for the battalion.

- (5) Exercises staff supervision of communication activities of attached units.
- (6) Works under the staff supervision of the S3, and coordinates with other staff officers as appropriate.
- (7) Is located physically at the command post.

d. The Maintenance Officer. His general duties are as shown in (1) through (3) below. (For specific duties, see par. 116).

- (1) Supervises and coordinates the maintenance activities of the battalion, except medical and signal.
- (2) Commands the battalion maintenance platoon.
- (3) Works under the staff supervision of the S4 and coordinates with other staff officers as appropriate.

70. Support Platoon Leader

a. The support platoon leader commands the battalion/squadron support platoon and functions as the assistant S4 and ammunition officer.

b. The duties and functions of the support platoon leader are discussed in chapter 6.

71. Fire Support Coordinator (FSCOORD)

a. The brigade fire support coordinator is normally the commander of the division artillery battalion supporting the brigade, or his designated representative. The battalion fire support coordinator is normally an artillery liaison officer from the same artillery battalion.

b. The fire support coordinator operates under the staff supervision of the S3 and advises and assists the commander and his staff on fire support planning and coordination.

c. When no artillery officer is available, the battalion commander usually designates the mortar and Davy Crockett platoon leader as FSCOORD.

d. The fire support coordinator's duties include—

- (1) Advising the commander and staff on all fire support matters.
- (2) Preparing the fire support part of the battalion SOP.

- (3) Preparing battalion plans of fire support.
- (4) Coordinating all supporting fires, including certain aspects of close air support and air-delivered nuclear weapons (in conjunction with S3).
- (5) Keeping supporting artillery units informed of the battalion situation.
- (6) Planning and coordinating air defense according to the policy established by higher headquarters and the battalion commander's directives.

72. Other Special Staff Officers

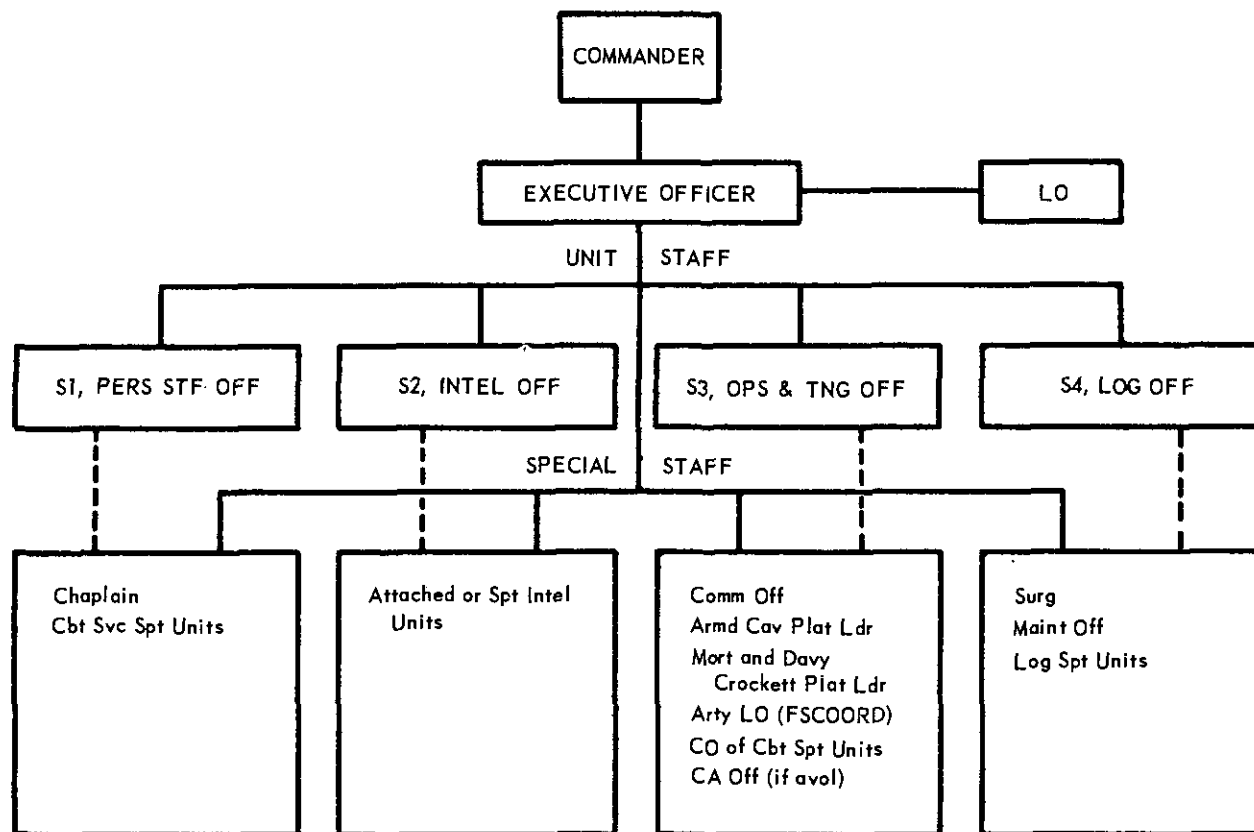
Tables of organization do not provide separate special staff officers for such functions as safety, claims, postal officers, etc. The commander may appoint one of his staff or other officers to serve in a special staff capacity in addition to his other duties.

73. Staff Intrarelations

Figure 2 shows the general relationship between the unit and special staffs. Though not indicated in the diagram, special staff officers have direct access to all members of the unit staff on matters within their primary responsibilities. During staff functioning—

a. The unit staff insures that the special staff is informed of the plans, policies, and decisions of the commander. It obtains information, estimates, and recommendations from the special staff and uses this data in preparing integrated reports, estimates, recommendations, and plans for the commander. Staff officers, both unit and special, must keep each other informed on matters of common interest.

b. A special staff officer usually deals with the commander through the appropriate unit staff officer; however, technical considerations of a particular problem may make it desirable for him to present information and recommendations directly to the commander. Whenever a special staff officer has direct contact with the commander, he should inform the appropriate staff officer or officers of the information exchanged and the recommendations made when appropriate.



Note. The dotted line indicates primary unit staff responsibility for staff supervision of the personnel or activity. Even though two or more unit staff officers may have an interest in the activity, a commander assigns the responsibility to only one to avoid conflict. The commander bases these decisions on his desires and the best arrangement to achieve his objectives.

Figure 2. Relationship between unit and special staffs.

74. Command and Staff

a. General. The command and staff sequence presented in this section is included as a training vehicle for development training of the commander and his staff. Becoming thoroughly familiar with the steps in the command and staff sequence develops the ability to use abbreviated estimates discussed in appendix VII. In highly mobile, fast-moving situations, the se-

quence described in *b* below will be compressed or curtailed frequently due to time limitations. Trained and experienced commanders and staffs continually keep abreast of the situation and constantly make or revise estimates. The commander makes rapid decisions and, for the most part, issues oral and fragmentary orders. Once an operation begins, subordinate commanders will seldom be called to the rear to receive an order. The techniques of application

of the command and staff sequence will vary with the personalities of the commander and staff, the time available, and the professional abilities of the commander and his staff.

b. Command and Staff Sequence.

- (1) Upon receipt of a mission from higher headquarters, the commander and staff study the mission to insure that they thoroughly understand its implications, as regards specified and deduced missions and tasks. The commander assembles his staff and receives the latest information from their respective fields of activity. Based on this information, his knowledge of the situation (including a study of the map), knowledge of the next higher commander's future plans and intentions, and his professional experience and judgment, he formulates and disseminates his *planning guidance*. This guidance provides the necessary direction for concurrent planning by the staff and a framework for making studies and estimates. It should include an analysis of the mission, any special aspects of the situation, any courses of action the commander desires the staff to consider in their estimates, restrictions placed on the operation, and an indication as to allocations of means (combat power). Planning guidance from the commander is essential and eliminates needless exploratory work by the staff. The planning guidance may be brief or exceedingly detailed, depending upon the relations of the commander with his staff and the length of the time they have functioned as an entity.
- (2) The staff, having received the commander's planning guidance, begin their individual *staff estimates*. Formulation of the operation estimate requires certain detailed information from other staff officers. The S2 furnishes the S3 the results of his analysis of the weather, terrain, enemy situation, and enemy capabilities. The S1 and S4 furnish the S3 details per-

taining to their respective fields. The S3 then determines the possible courses of action that will accomplish the mission and announces them to the other staff officers. The S2 evaluates his own estimate in the light of the courses of action to determine if additional detailed intelligence is required. The S1 and S4 evaluate their estimates, from their respective viewpoints, to determine what limitations exist as to their support and which course is favored. During the preparation or revision of staff estimates, planning for the employment of supporting fires, including nuclear weapons, is accomplished by the fire support coordinator.

- (3) Each unit staff officer completes his estimate, arriving at recommendations to be made to the commander. A meeting is then conducted during which the S3 presents one or more courses of action and recommends priority. Each of the other staff officers comments in turn on significant aspects in his respective field and recommends the best course of action from his standpoint. The commander may question his staff to ascertain any additional information he requires to complete his own estimate (commander's estimate).
- (4) The commander completes his estimate and announces his *decision*. The decision is a statement of the general course of action that the unit will adopt to accomplish the mission. So that the staff may prepare detailed plans to execute the decision, the commander must elaborate upon the decision by issuing the *concept*. This concept is presented to the staff at the time of the announcement of his decision, in enough detail to permit preparation of orders. This concept in refined form becomes the basis for paragraph 3a appendix IX, of the operation order. For a discussion of what may be included in the commander's concept, see paragraph 45b.

(5) Based on the decision and the concept, the staff will *complete their planning* and prepare necessary orders. The S3 has primary staff responsibility for the preparation of the plan. Additional details for the operation are furnished the S3 by unit and special staff officers as a result of their planning. The plan will then be presented to the commander for his approval. After approval, the plan may be issued to subordinate units to facilitate their planning or it may be converted into an order and issued to subordinate units.

(6) After the order is issued, the commander, assisted by his staff, *supervises its execution*. The staff coordinates with and assists the subordinate units where possible.

(7) The executive officer supervises the staff through the entire planning sequence to insure that the proper coordination takes place between staff officers, and that the commander's desires are being followed. By keeping abreast of the situation, the executive officer is prepared to assume command if necessary.

CHAPTER 5

RECONNAISSANCE AND SECURITY OPERATIONS

Section 1. RECONNAISSANCE OPERATIONS

75. General

a. Reconnaissance is the directed effort in the field to collect information of the enemy and the area of operations by ground and air activities. This information is classified under the headings of enemy, terrain, weather, and enemy's resources.

b. The purpose of reconnaissance is to obtain combat information of the enemy and the area of operations for the production of combat intelligence. The combat intelligence produced is used by the commander in planning and conducting combat operations. Reconnaissance information and the resulting combat intelligence seek to reduce the unknown aspects of the enemy and the area of operations and contribute to the accuracy of evaluating risks involved and the successful application of combat power.

c. Reconnaissance and security complement each other and cannot be readily separated. Effective ground and air reconnaissance provides a certain amount of security, and a security force provides information of the enemy and the area of operations.

d. Reconnaissance is a continuing responsibility of each commander and each soldier. Unit training, SOP's, and the commander's instructions to subordinates must emphasize the importance of timely and accurate reports of both positive and negative information of the enemy and the area of operations. Reports should contain facts not opinions. Information is reported as it is obtained.

e. The use, or the threat of use, of nuclear weapons and chemical agents necessitates the use of techniques in armor operations to determine the absence of contamination or the degree of contamination in specific areas.

76. Reconnaissance Agencies

a. Ground reconnaissance agencies include personnel and units specifically organized, designed, or designated to perform reconnaissance. Armor units specifically designed for reconnaissance are the armored cavalry regiment, the divisional armored cavalry squadrons, and the reconnaissance platoon organic to each combat maneuver battalion. Other units not organized and equipped essentially for conducting reconnaissance may be considered reconnaissance agencies when their missions involve to a considerable degree the performance of reconnaissance.

b. Divisional armored cavalry squadrons are equipped to conduct air and ground reconnaissance and surveillance with medium and short range ground radar.

c. Army aviation units provide air observation, photography, and electronic surveillance and are excellent agencies to supplement ground reconnaissance efforts.

d. Tactical air provides an air reconnaissance and photography capability.

77. Fundamentals of Reconnaissance Operations

Reconnaissance operations vary with the situation and conditions in the area and with the assigned missions, size, type, and composition of the reconnaissance units. Ground combat reconnaissance operations are performed in conformance with the following five fundamentals.

a. *Orient on the Location or Movement of the Intelligence Objectives.* Units performing reconnaissance must maneuver according to the location or movement of the intelligence, objective rather than the location or movement of

friendly forces. The objective may be enemy troops, a terrain feature, or a locality. To effectively perform the operation, commanders of units conducting reconnaissance must be allowed maximum freedom of action.

b. Report all Information Accurately. Reconnaissance is conducted to obtain information to be used in the production of combat intelligence. To be of value to the commander, this information must be received in time to be of use and must be accurate in answering the questions *what* (including how many), *when*, *where*, and *doing what*. All members of units conducting reconnaissance missions must report all positive or negative information rapidly and accurately to the next higher headquarters. When considered in conjunction with information from other sources, information that appears unimportant to one level of command may be extremely valuable to the next higher commander. The development and use of brief reconnaissance spot report forms (app. V) will facilitate the rapid transmission of essential information. A reconnaissance unit has not fully accomplished its mission until it has reported all information gathered to the next higher headquarters.

c. Avoid Decisive Engagement. Units performing reconnaissance obtain information by stealth whenever possible, but fight when necessary to gain the desired information. The reconnaissance mission must not be jeopardized by combat with the enemy when combat is not essential to obtain the information desired.

d. Maintain Contact with the Enemy. In the performance of a reconnaissance mission to obtain information of an enemy force, contact with the enemy is gained as soon as possible. Once contact has been made, it is maintained, and is not voluntarily broken without authority from higher headquarters. Contact can be maintained by ground or air observation.

e. Develop the Situation. When enemy contact is made or an obstacle is encountered, the situation must be developed quickly. The enemy's location, strength, composition, and disposition are determined, with special effort being made to determine the flanks of his position. A decision to attack or bypass the position, in keeping with the mission, is reached as

quickly as possible. When terrain permits, the enemy position is reconnoitered by mounted reconnaissance. Reconnaissance by fire may be employed when time is critical. If the terrain restricts vehicular movement, the situation is developed with dismounted patrols while other elements of the unit support their movement.

78. Types of Reconnaissance Missions

There are three types of reconnaissance missions: route, zone, and area. The type to be employed is determined after considering the information desired, where the information is to be sought, the known enemy situation, terrain, size of the reconnaissance force, and the time available for obtaining the information.

79. Route Reconnaissance

a. Route reconnaissance is the directed effort to obtain information of the route, obstacles, and enemy along a specific route, and the terrain adjacent to the route, which, if occupied by the enemy, would affect movement along the route.

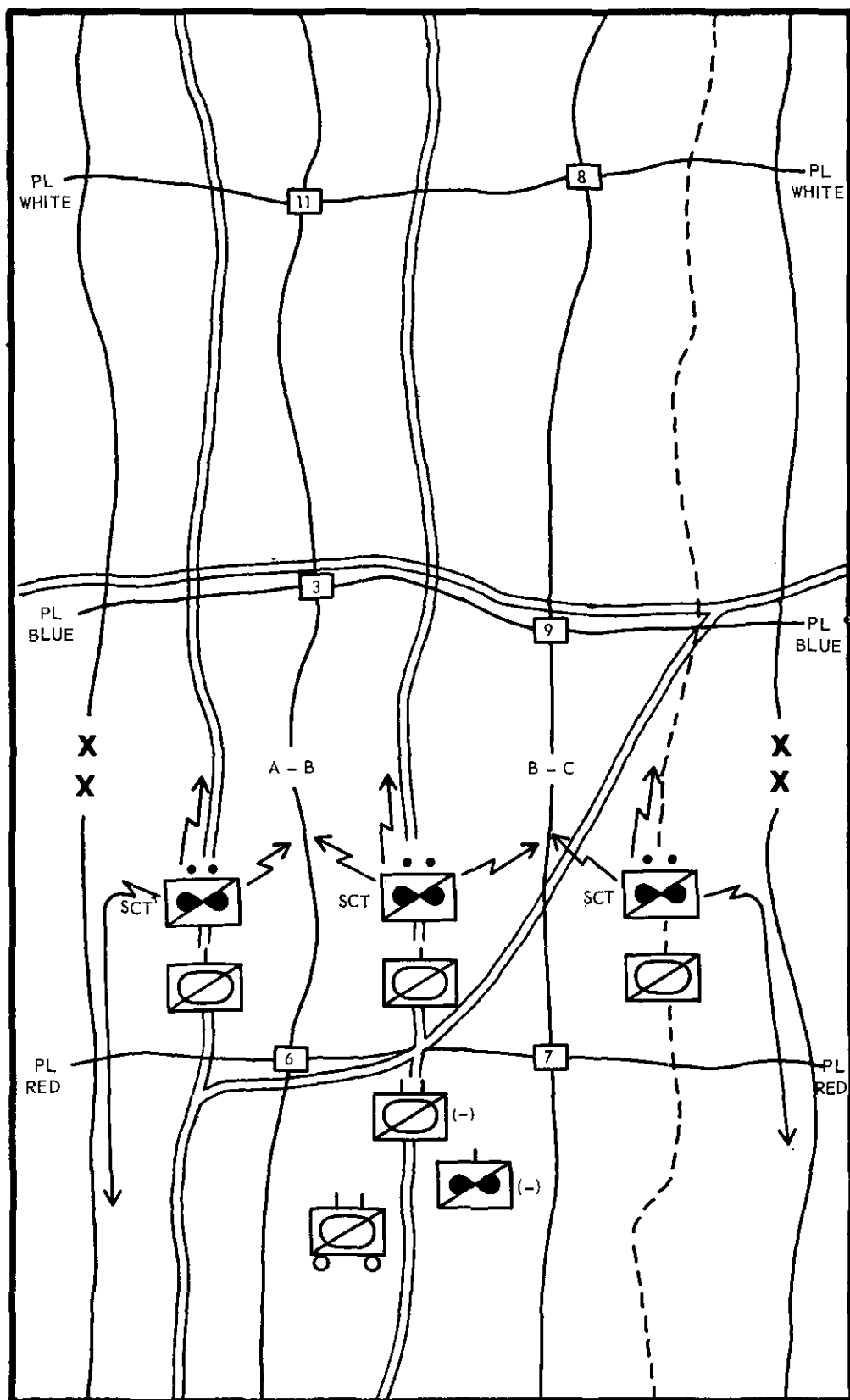
b. Route reconnaissance may be assigned to obtain information of a specific route (see FM 5-36 for discussion and report format) or of an enemy force moving generally along a specific route. When intelligence indicates that the enemy is moving on one or more routes, or when terrain features canalize his advance, these routes may be reconnoitered to obtain enemy information. Routes of advance of friendly forces may be reconnoitered when specific information of a route or series of routes is required.

c. The techniques employed and the requirements of a route reconnaissance are less time consuming and can normally be performed more rapidly than zone or area reconnaissance.

80. Zone Reconnaissance

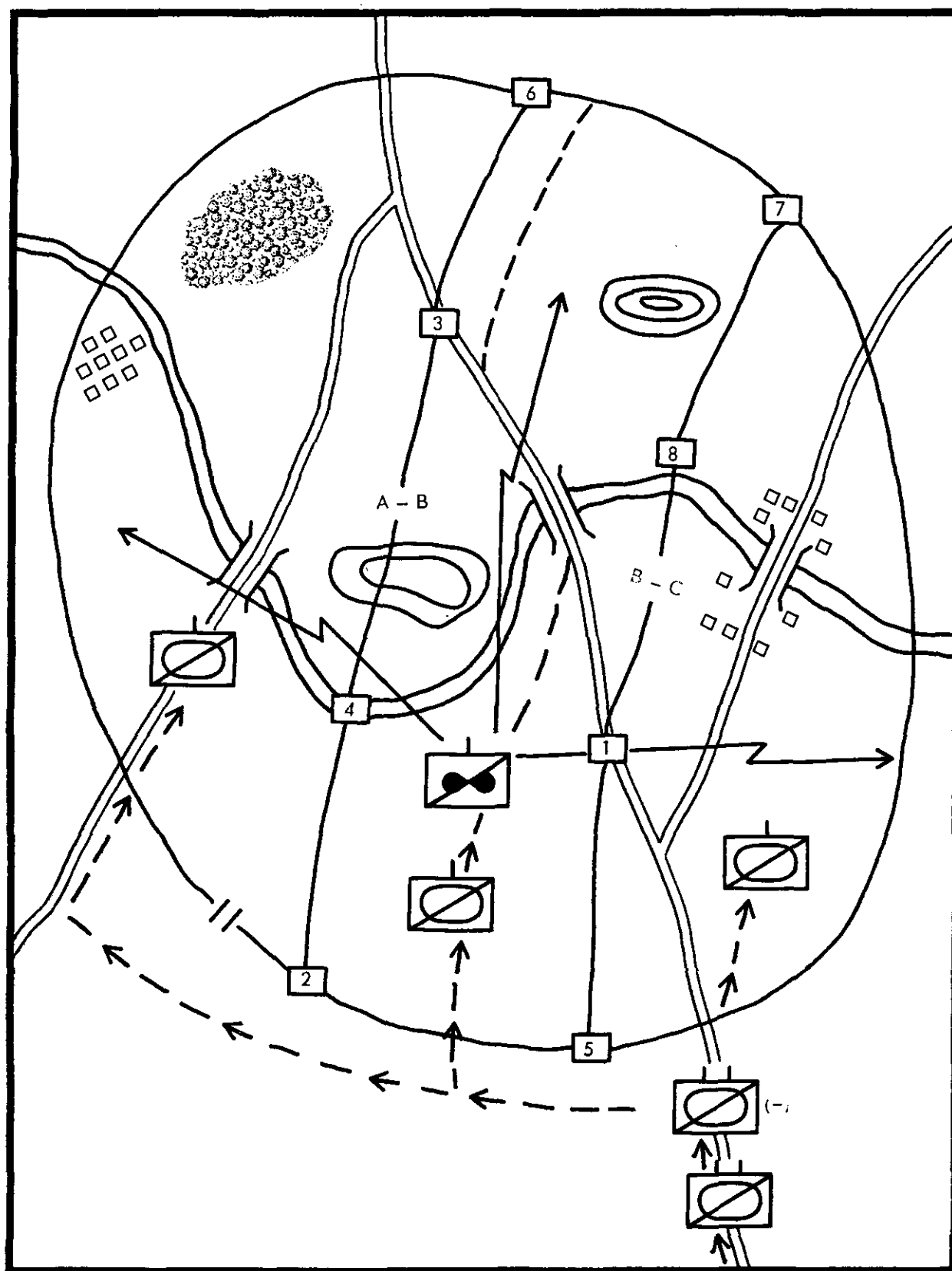
a. Zone reconnaissance is the directed effort to obtain detailed information of all routes, terrain, and enemy forces in a zone defined by boundaries (1, fig. 3). Zone reconnaissance is more thorough and time consuming than other reconnaissance missions.

b. When the enemy's location is in doubt, or when it is desired to locate suitable routes or



1 Zone

Figure 3. Reconnaissance.



2 Area
Figure 3—Continued.

determine cross-country trafficability in a zone, a zone reconnaissance may be directed. The width of the zone assigned to subordinate units is determined by the pattern of the road net, terrain features, type of information desired, anticipated enemy action, troops available, weather, visibility, and time available to accomplish the mission.

81. Area Reconnaissance

a. Area reconnaissance is the directed effort to obtain detailed information of all routes, terrain, and enemy forces within a clearly defined area (2, fig. 3).

b. Area reconnaissance is performed to gain information of a definite locality such as towns, woods, or crossing sites over a river. The area may be reconnoitered for possible enemy or to determine its suitability as an assembly area or for other uses by friendly forces. The area to be reconnoitered must be clearly delineated. The unit assigned the mission moves directly to the area and conducts the reconnaissance employing the same techniques as a zone reconnaissance.

82. Reconnaissance by Fire

a. Reconnaissance by fire is accomplished by firing on likely or suspected enemy positions in an attempt to cause the enemy to disclose his presence by movement or firing. During reconnaissance by fire, positions being reconnoitered must be observed continuously, so that any enemy movement or return fire will be definitely located.

b. Reconnaissance by fire is used when time is critical. It is made at the risk of losing surprise, but it tends to lessen the probability of moving into a well-concealed enemy position without being aware of its presence.

c. If the enemy returns the fire, the unit proceeds to develop the situation. If the fire is not returned, the unit continues on its mission. However, caution should be exercised, because reconnaissance by fire may fail to draw the fire of seasoned enemy troops.

83. Reconnaissance of a Town, Obstacle, or Enemy Position

a. In reconnoitering a town, obstacle, or enemy position, it should be approached from

the flanks or rear if possible. If time is available, the reconnaissance is made dismounted; however, if time is short, the unit remains mounted. Detailed observation should precede the actual reconnaissance.

b. When time is available, dismounted patrols move forward, covered by the remaining elements of the unit. The number of patrols depends upon the size of the objective and upon available approaches, cover, and concealment. If the patrols find that the near edge of the area is clear, the remainder of the unit moves forward. The dismounted patrols then continue the reconnaissance, overwatched and followed closely by the rest of the unit.

c. In conducting a mounted reconnaissance, part of the unit moves forward rapidly, overwatched by the remaining elements. If the near edge of the area is clear, the overwatching elements move forward and the advance continues. Vehicles move through a town by bounds in staggered formation, covering the buildings on the opposite side of the street by observation and fire.

84. Reconnaissance of a Bridge or Defile

Visual reconnaissance is made for enemy positions that dominate the bridge or defile before leading elements of the unit cross the bridge or enter the defile. When mines, boobytraps, or ambushes are suspected, patrols reconnoiter the approaches of the bridge or defile. Reconnaissance of a bridge includes checking underneath as well as on top for mines, boobytraps, demolition charges, or weakened construction. Any demolitions located should be removed or neutralized. The class of a bridge should be determined and a sign placed on the bridge to indicate the class to troops using it later.

85. Reconnaissance at Night

Reconnaissance operations are slower and less effective at night. Night reconnaissance is limited usually to dismounted patrolling, observation of routes, and the use of listening posts. Only against light enemy resistance and with favorable terrain and routes of advance can vehicular reconnaissance be used without being preceded by dismounted patrols. Cross-

country movement is more difficult. Engines and tracked vehicle movements can be heard for considerable distances. Observation is limited, making vehicles highly susceptible to ambush.

86. Reconnaissance in Force

a. A reconnaissance in force differs from a route, zone, or area reconnaissance in that it is a limited-objective offensive operation by a considerable force to discover and test the enemy's dispositions and strengths, or to develop other intelligence. Although its primary aim is reconnaissance, it may discover weaknesses in the enemy dispositions which, if exploited promptly, may enhance tactical success.

b. The reconnaissance in force normally develops information more rapidly and in more detail than other reconnaissance methods.

c. For a detailed discussion see chapter 7.

87. Reconnaissance by Air Vehicles

a. Army air vehicles extend, supplement, or, in some instances, replace ground reconnaissance means. Commanders not having organic air vehicles should request them to support their reconnaissance efforts.

b. Army air vehicles are normally employed in conjunction with, and in close support of, ground reconnaissance forces. Air vehicles are used to extend the reconnaissance effort by air observation, air photography, and electronic surveillance.

c. Army air vehicles may be used to conduct radiological surveys and to locate routes through or around contaminated areas when time is a governing factor.

88. Reconnaissance Frontages

There is no established frontage for a given size of force conducting a reconnaissance mission. The visibility, terrain, road net, enemy situation, nature of the information sought, and time available are factors that influence reconnaissance frontages that are assigned to a unit. If detailed rather than general information is desired, the operation will be more time-consuming; therefore, the frontage should be narrower than that for general information.

Wider frontages may be assigned when air vehicles or air cavalry units are available.

89. Coordination and Control During Reconnaissance Operations

a. Reconnaissance must be coordinated at all levels of command. This will insure maximum results from the intelligence effort, prevent duplication of effort, and provide for economical use of reconnaissance force. Coordination is accomplished primarily by assigning a specific mission to each reconnaissance unit.

b. The commander conducting the reconnaissance uses radio as the primary means of control. Phase lines, checkpoints, contact points, boundaries, routes, objectives, and time limitations are used by the commander in controlling his unit. Liaison personnel, staff officers, messengers, and air vehicles are used to assist in the rapid transmission of reconnaissance instructions and reports.

90. Reconnaissance Instructions

Reconnaissance instructions must be complete and include exactly what combat information is to be obtained, the time by which the information must be reported, where the information is to be sought, and when the mission is to be executed. Essential details may include—

- a.* Pertinent information of the enemy and friendly troops.
- b.* Plans of the higher commander.
- c.* Specific information desired.
- d.* Zone, area, or route to be reconnoitered.
- e.* When, where, and how information is to be reported to the higher commander.
- f.* Time of departure.
- g.* Appropriate control measures.
- h.* Action to be taken when mission is completed.

91. Transmitting Information

Rapid transmission of information is essential to the success of any reconnaissance mission. This is a basic fundamental of reconnaissance operations. For a detailed discussion see paragraph 77.

92. General

a. Security includes all measures taken by a command to protect itself from espionage, observation, sabotage, annoyance, or surprise. Its purpose is to preserve secrecy and to gain and maintain freedom of action.

b. Security is achieved by effectively providing for the detection of a threat; for sufficient time and maneuver space to react to the threat; and for the avoidance, neutralization, or destruction of the threat. Security is enhanced by timely and accurate intelligence and rapid, aggressive movement. All units are responsible for their own security, regardless of the security provided by other units. A security force for a larger formation must be strong enough, and properly located, to provide adequate time for the main body to react. Within their capabilities, security forces will engage the enemy as necessary to accomplish their mission. However, security measures must not unnecessarily divert forces or effort from the accomplishment of the mission of the force being secured.

93. Security Against Ground Action

Ground threats to the security of a command include reconnaissance, fire, attack by ground forces, infiltration, irregular forces, partisans, and airmobile and airborne forces. Security forces must use terrain and terrain obstacles to enhance their security efforts. Security against ground attack is provided by air and ground reconnaissance; covering forces; advance, flank and rear guards; and local security elements. Size and composition of security forces are dependent upon the factors of METT. Against a highly mobile enemy, strong in armor, security forces must be of equal or greater mobility and possess adequate antitank capabilities. Natural and artificial obstacles are used to the maximum. In any case, security forces must be afforded the capability of effective operations under the same conditions as the enemy force that poses the threat.

94. Fundamentals of Security Operations

Although the fundamentals of security are closely related, the provision of timely and ac-

curate warning and space for maneuver is paramount. The actions of security forces should be guided by the practical application of these fundamentals through the effective use of available resources.

a. *Provide Timely and Accurate Warning.* The security force must provide the commander of the force being secured early warning of the location and movement of enemy forces that constitute a threat to his mission. Only by timely warning and accurate information can the commander of the force being secured choose the forces, time, and place to engage the enemy, and maneuver his forces to gain tactical surprise and advantage.

b. *Provide Space for Maneuver.* Security forces operate far enough from the force being secured to insure that this force has enough time and space to maneuver to meet or avoid the enemy threat. The distance between a security force and the force being secured varies according to the factors of METT.

c. *Orient on the Location or Movement of the Force Being Secured.* A security force maneuvers according to the location and movement of the force being secured, and positions itself between the friendly force and the known or suspected enemy threat.

d. *Perform Continuous Reconnaissance.* All security forces must perform continuous and aggressive reconnaissance. The reconnaissance provides the security force commander with information of enemy forces in his area of responsibility and enables him to properly position the security force in relation to the force being secured and the enemy threat. Reconnaissance provides security from surprise by keeping the commander of the force being secured informed of enemy locations and movements, and by maintaining contact with enemy forces that constitute a threat.

e. *Maintain Enemy Contact.* Once contact with the enemy has been gained, it must be maintained until the enemy ceases to be a threat to the force being secured or moves out of the assigned area of responsibility. Contact is not voluntarily broken unless ordered by higher headquarters. Enemy forces must not

be permitted to surprise the force being secured. If the enemy force moves out of the area of responsibility, action must be taken to inform the adjacent unit and to assist in establishing contact with the enemy force.

95. Frontages in Security Operations

The extent of the frontage assigned in security operations depends on several factors, including the degree of security desired, the length of time the security is required, the enemy capabilities, the terrain (with emphasis on avenues of enemy approach), and the weather. Wider frontages may be assigned when air vehicles or air cavalry units are available.

96. Action on Contact

When contact with an enemy force is made, the following action is taken.

a. Deploy and Report.

- (1) Units move immediately to positions from which they can fire, observe, or be employed against the enemy.
- (2) The commander immediately reports the enemy contact to higher headquarters.

b. *Develop the Situation.* Action is taken to determine the strength, location, composition, and disposition of the enemy.

c. *Choose a Course of Action.* After developing the situation, the commander chooses a course of action appropriate to the immediate situation as well as to the accomplishment of the assigned mission.

d. *Report.* The commander then reports to his higher headquarters, including—

- (1) The complete enemy situation as it has been developed.
- (2) The decision of the commander as to the course of action he will follow.

97. Security Forces

A security force may be an advance guard, a rear guard, a flank guard, a screening force, a covering force, or a rear area security force, according to its location in relation to the force being secured and its purpose (fig. 4). It may

engage in offensive, defensive, or delaying action as required to accomplish the mission.

98. Advance Guard

a. An advance guard is a security force, primarily offensive in nature, that operates to the front of a moving force to insure its uninterrupted advance and to protect it from surprise attack by defeating, destroying, or delaying the enemy. The advance guard may cover the deployment of the main body if it is committed to action and may facilitate the advance by removing obstacles, repairing roads and bridges, or locating bypasses.

b. The advance guard moves as fast as the situation will allow but should remain within supporting distance of the main body. It performs continuous reconnaissance to the front and flanks and pushes back or destroys small

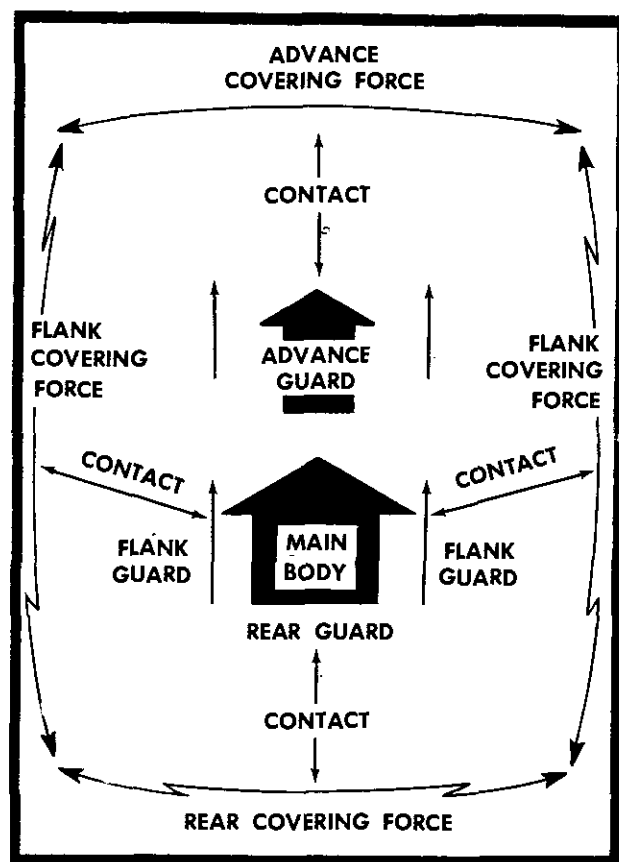


Figure 4. Relationship of advance, flank, and rear guards to covering forces.

enemy groups before they can hinder the advance of the main body. When the advance guard encounters large enemy forces or heavily defended areas, it takes prompt and aggressive action to develop the situation and, within its capability, employs offensive action to defeat the enemy. It employs every means available to determine the location, strength, disposition, and composition of the enemy. It may then be required to join in the attack of the main body. The advance guard must be far enough in front of the main body to insure that the commander has freedom of action in the employment of the main body. However, it must not be so far in front that it can be destroyed by enemy attack before assistance can reach it. Distances are reduced at night, in close terrain, and under conditions of low visibility.

c. The advance guard normally advances in column until contact is made. It may move continuously or by bounds. It moves by bounds when contact with the enemy is imminent and the terrain is favorable. For additional information, see FM 17-36.

99. Flank Guard, General

A flank guard is a security force that operates to the flank of a moving or stationary force to protect it from enemy ground observation, direct fire, and surprise attack by defeating, destroying, or delaying the enemy within its capabilities. It may employ offensive, defensive, or delaying action as necessary to accomplish the mission. During offensive or retrograde operations, the flank guard is mobile when the force being secured is moving at a rate that requires the flank guard force to move. When the force being secured is conducting defensive operations, the flank guard is normally stationary but plans for and is prepared to conduct a mobile flank guard action should the situation require movement by the friendly force.

100. Flank Guard Methods of Movement

There are three basic methods of movement that may be employed by the mobile flank guard: alternate bounds, successive bounds, and continuous marching. The method selected depends upon the rate of advance of the main body and the enemy situation.

a. *Alternate Bounds.* This method may be used when the element being secured is advancing slowly and strong enemy resistance is anticipated against the flank guard. In this situation, it is planned that each of the blocking positions will be secured as it is reached, to provide the maximum flank protection possible. As the flank guard advances and the first blocking position is reached, the commander designates a unit to secure it. The commander must be prepared to conduct a coordinated attack if necessary to secure the position. The remainder of the flank guard continues along the route or axis of advance, and as the next blocking position is uncovered, the commander designates another unit to secure it. When all subordinate units have been employed and the main body's advance requires the securing of additional positions to the front, the rear unit is moved forward from its previously occupied blocking position to a new one to the front.

b. *Successive Bounds.* This method is used when the movement of the force being secured is characterized by frequent short halts. Each subordinate unit occupies designated blocking positions on the likely avenues of enemy approach from the flank. When forward movement is resumed, subordinate units retain their relative position in the flank guard formation as they move forward to occupy successive blocking positions. The distance between subordinate units is determined by the area of responsibility, location of blocking positions, likely avenues of enemy approach, and the rate of advance of the force being secured.

c. *Continuous Marching.* This method is used when the force being secured is advancing rapidly at a constant rate. The flank guard uses a column formation and moves without halting, adjusting its rate of advance to the movement of the force being secured. The distance between subordinate units is determined in the same manner as when moving by successive bounds. The commander indicates which avenues of enemy approach and key terrain features are to be given special attention. Air and ground elements reconnoiter to the flank as the remainder of the unit moves along the route of advance.

101. Flank Guard Planning and Conduct

a. The commander plans a flank guard mission in the following sequence:

- (1) Initially he makes a map reconnaissance of the area of operations and selects the most likely avenues of enemy approach from the flank. He selects a series of blocking positions on the flank that generally parallel the axis of advance of the force being secured. These blocking positions should be located on defensible terrain that dominate likely avenues of enemy approach. The blocking positions should be far enough from the flank of the force being secured to give it timely warning of enemy approach and to provide it with sufficient time and maneuver space to react to an enemy threat. If the flank guard force encounters a superior enemy force, the positions should be far enough to provide sufficient terrain for the conduct of a delaying action toward the force being secured. However, the distance between the axis of advance or flank of the force being secured and the line of blocking positions should not be so great that one armored cavalry troop or company team cannot secure this frontage.
- (2) The flank guard commander selects the route of advance unless it has been prescribed by higher headquarters. The route of advance should be far enough from the axis of advance of the force being secured to prevent the flank guard force from interfering with the maneuver of the main body. The route should permit rapid access to the line of blocking positions.
- (3) The flank guard commander next develops a scheme of maneuver that will enable him to seize and hold selected blocking positions and secure the area between the axis of advance of the leading task force of the main body and the route or axis of advance of the flank guard force. The scheme of maneuver provides for seizing the

blocking positions either by individual units or by the entire flank guard force.

- (4) Contact points are selected between blocking positions to delineate the area of responsibility for the unit holding each position. Contact points should be easily identifiable on the ground, located forward of the line of blocking positions, and centered between blocking positions. When a unit is ordered to occupy a blocking position, it is responsible for the area between the contact points on each flank. The unit is required to make physical contact with adjacent units at the contact point.
- (5) The commander selects a formation that will permit rapid employment against an enemy threat. The formation must be flexible to meet any change in the situation. The column formation provides the best control and flexibility. The flank guard force provides its own security. Air vehicles or air cavalry elements may be used to secure the flank guard force and extend reconnaissance.

b. During a mobile flank guard operation, the lead unit acts as the advance guard for the flank guard force, secures the area between the force being secured and the flank guard route of advance, and maintains contact with the rear of the leading battalion task force of the force being secured. It may be necessary to reinforce the leading unit for it to accomplish its threefold mission. The remainder of the flank guard moves in column, prepared to secure blocking positions on order. The decision to occupy these positions will depend on the speed with which the main body is advancing and the enemy situation on the exposed flank. The method of movement selected depends on the rate of advance of the force being secured and the enemy situation. If the flank guard becomes overextended, the flank guard commander should ask for permission to screen the area (observing and reporting) or to be relieved of responsibility for the rear part of the area. This request would be in the form of a recommendation to the main body commander (fig. 5).

AGO 9139A

102. Flank Guard for an Attacking Force

a. The area of responsibility of a flank guard for an enveloping or exploiting force of larger than battalion size normally starts at the rear of the leading battalion task force and extends to the rear of the last combat element of the main body. The responsibility of a flank guard for a battalion task force normally begins at the rear of the leading company team and ends at the rear of the combat elements of the battalion task force.

b. There are special considerations in planning for the use of the flank guard in a penetration or an attack out of a bridgehead. These considerations are the relatively narrow front on which a penetration is normally conducted, in conjunction with a passage of lines which requires close liaison and coordination during the period when maneuver space is limited. In the performance of a flank guard mission during a penetration—

- (1) The blocking positions normally are selected by the main body commander.
- (2) Initially, when a penetration is made through friendly frontlines, a division or brigade flank guard's area of responsibility starts at the shoulder of the penetration (which is held by friendly forces) and extends forward to the rear of the leading battalion task force or company team of the main body. When the last combat element of the main body moves through the gap, the flank guard's area of responsibility is normally changed to that of an enveloping or exploiting force as discussed in *a* above.
- (3) The movement through the gap of the penetration by the force executing the penetration and the flank guard unit must be closely coordinated. The leading element of the flank guard normally follows the leading major command of the main body through the gap until the situation permits its movement to the flank. The lead flank guard unit acts as the advance guard for the main flank guard force; and secures the area between the rear of the leading battalion task force and

the flank guard route of advance. When the remainder of the flank guard unit moves through the gap, it moves to the flank and is prepared to seize and occupy blocking positions or to meet a counterattack by the enemy. The initial phase of the operation will usually be a slow-moving operation; therefore, the flank guard normally employs the alternate bound method of movement. When the flank guard is attacked by a superior enemy force, it conducts a delay action, providing time and space for the main body to react to the enemy threat (fig. 6).

103. Flank Guard for a Defensive Force

The flank guard for a defensive force occupies a series of blocking positions on the flank. The blocking positions are located on key terrain features that dominate likely avenues of enemy approach into the sector. The flank guard normally is given a sector of responsibility which is tied in to specific terrain features. In the accomplishment of the mission, the flank guard employs defensive or delaying tactics. If forced from its positions, it conducts a delaying action, providing time and space for the commander conducting the defense to react to the threat.

104. Flank Guard for a Retrograde Movement

The operations of a flank guard for a unit performing a retrograde movement are similar to those of a flank guard for an advancing force. The major difference is in that the area of responsibility is from the front of the last unit (which may be the rear guard) to the front of the first unit in the formation.

105. Screening Force

a. A screening force, by surveillance over an extended frontage to the front, flank, or rear of a moving or stationary force, provides early warning by observing, reporting, and maintaining visual contact with enemy forces encountered. The missions of the screening force are to—

- (1) Provide timely warning of enemy approach.

AGO 9139A

- (2) Gain and maintain visual contact with, and report the movement of enemy forces.
- (3) Destroy or repel enemy patrols.
- (4) Impede the advance of enemy forces by employing long range organic and supporting fires.

b. A screening mission is assigned when economy of force requires that an extended area must be kept under surveillance and there are few troops available to perform the mission. The area may be along a river line, between widely dispersed units, or on an exposed flank where a major threat does not exist. The mission is accomplished by manning a series of observation posts that cover avenues of enemy approach into the sector. Foot, motor, and air patrols reconnoiter during the daytime and at night those areas that cannot be observed from the observation posts.

c. The main body commander designates the area of responsibility of the screening force. In determining the area of responsibility, the commander considers the factors of METT and the capability of the screening force to—

- (1) Maintain contact with the main body.
- (2) Reach the line of screening positions (OP's) on the flank.
- (3) Screen the area between the main body and the line of observation posts.

d. In planning a screening force operation, the screening force commander selects the general location for establishing a series of OP's and designates contact points between and forward of the line of OP's. When selecting the location of OP's, the following should be considered:

- (1) Overlapping fields of observation with other OP's.
- (2) Concealment of OP's and access routes.
- (3) Ease of installation.
- (4) Maintenance of communication.
- (5) Avoidance of landmarks.

e. Observation posts are positioned to provide for maximum observation and concealment. Mounted or dismounted patrolling is conducted between contact points consistent with the need for security. To be effective, a

screening force must have good radio communication between OP's and enough personnel to man the OP's for sustained periods and to patrol between the OP's and contact points. Ground radar should be used to cover major avenues of enemy approach. Air vehicles and air cavalry elements may be used to extend reconnaissance and materially increase the effectiveness of the security screen. It is desirable that each OP have one automatic weapon. Once visual contact has been made with the enemy it is maintained. OP's make accurate and timely reports and may direct the fires of supporting elements to harass advancing enemy forces. If permitted to withdraw, the screening force moves by bounds, maintaining visual contact with the enemy and continuing to adjust supporting fires. Under some circumstances small enemy patrols may be permitted to infiltrate the security screen so that larger enemy forces may be observed. Precaution must be taken to insure that the infiltrators do not join with other infiltrated forces and threaten the main body.

106. Covering Force

a. A covering force is a tactically self-contained security force that operates at a considerable distance to the front, flank, or rear of a moving or stationary force, with the mission of developing the situation early, defeating hostile forces, if possible, and deceiving, delaying, and disorganizing enemy forces until the main force can cope with the situation. This mission is not normally assigned to a unit smaller than a battalion task force or reinforced armored cavalry squadron. A covering force engages in any action necessary for the success of its mission and may be employed when the main force is engaged in offensive, defensive, or retrograde actions. An advance covering force mission is conducted employing techniques that are similar to those used in a route or zone reconnaissance operation. When employed as a rear covering force, the security force normally conducts a delaying action. A flank covering force employs techniques similar to those of a flank guard operation except that the covering force operates at a greater distance from the main body and beyond the advance, flank, or rear guard. The covering force

must not become engaged decisively, bypassed, or enveloped. The covering force should be completely mobile, tank heavy, and reinforced with infantry, artillery, engineers, and air vehicles as required.

b. When operating as an advance covering force in an offensive operation, a battalion task force or reinforced squadron advances with companies/troops abreast to insure complete coverage of the area and uncover enemy forces. Enough forces should be retained in reserve to influence local actions. The reserve is located to permit immediate employment to assist in the accomplishment of the mission. When contact with the enemy is made, the advance covering force attacks and destroys or disperses the enemy. An enemy force may be bypassed if stated in the mission or on order of the higher commander. An advance covering force for an offensive operation employs the techniques of offensive operations (ch. 7).

c. A battalion task force or reinforced squadron may be employed as a covering force for a larger unit conducting a defensive or retrograde operation. The distance at which the covering force operates forward of the FEBA is normally prescribed by higher headquarters. The covering force sector is divided into company/troop sectors, and the companies/troops are deployed to cover their assigned sectors. Observation posts and mobile patrols are established forward of the blocking positions. The blocking positions are located on key terrain that dominates likely avenues of enemy approach. Normally, a company/troop-size reserve should be retained. Tanks, infantry, artillery, and engineer elements should be attached to the covering force. When forced to displace, the covering force conducts a delaying action to the FEBA, avoiding decisive engagement with the enemy. Every effort must be made to deceive the enemy as to the true location of the friendly dispositions and the FEBA. The action of the covering force during the defense is generally the same as for a delaying action (ch. 9).

d. When employed as a rear covering force to cover a withdrawal or a retirement, the covering force uses the friendly frontline, or a position near it, as its initial position. The

technique of performing this mission is the same as described in c above.

e. All elements of the covering force, including engineers, artillery, and Army aviation, should be placed under one commander. The covering force commander operates under the direct control of the main body commander. The main body commander specifies the area of operation or the units to be protected.

107. Rear Guard

a. A rear guard is a security force that operates to the rear of an advancing or withdrawing force to protect it from enemy surprise attack or annoyance by defeating, destroying, or delaying the enemy within its capabilities (fig. 7). The rear guard follows the main body at a distance prescribed by the main body commander and usually moves over the same route or routes. It is prepared to intercept and engage enemy forces that attempt to attack the rear of main body. If attacked by superior forces, the rear guard employs delaying action. It must not permit itself to be bypassed or driven into the main body until the main body can take action to cope with the threat. During the advance by the main body, the rear guard protects the main body trains and collects stragglers.

b. When planning a rear guard operation the commander considers the following:

- (1) *Terrain.* The commander analyzes the terrain in the area of operations and selects a series of delaying positions along the prescribed route of advance or withdrawal. With respect to terrain, the ideal procedure is for the rear guard to withdraw over routes used by the forces being protected.
- (2) *Organization of the rear guard.* The commander must determine the size force to be employed on the initial delaying position. If the situation permits, he may position subordinate units in depth. He assigns a route or routes of withdrawal and designates measures to insure effective control, which may include delay lines, delay positions, phase lines, checkpoints,

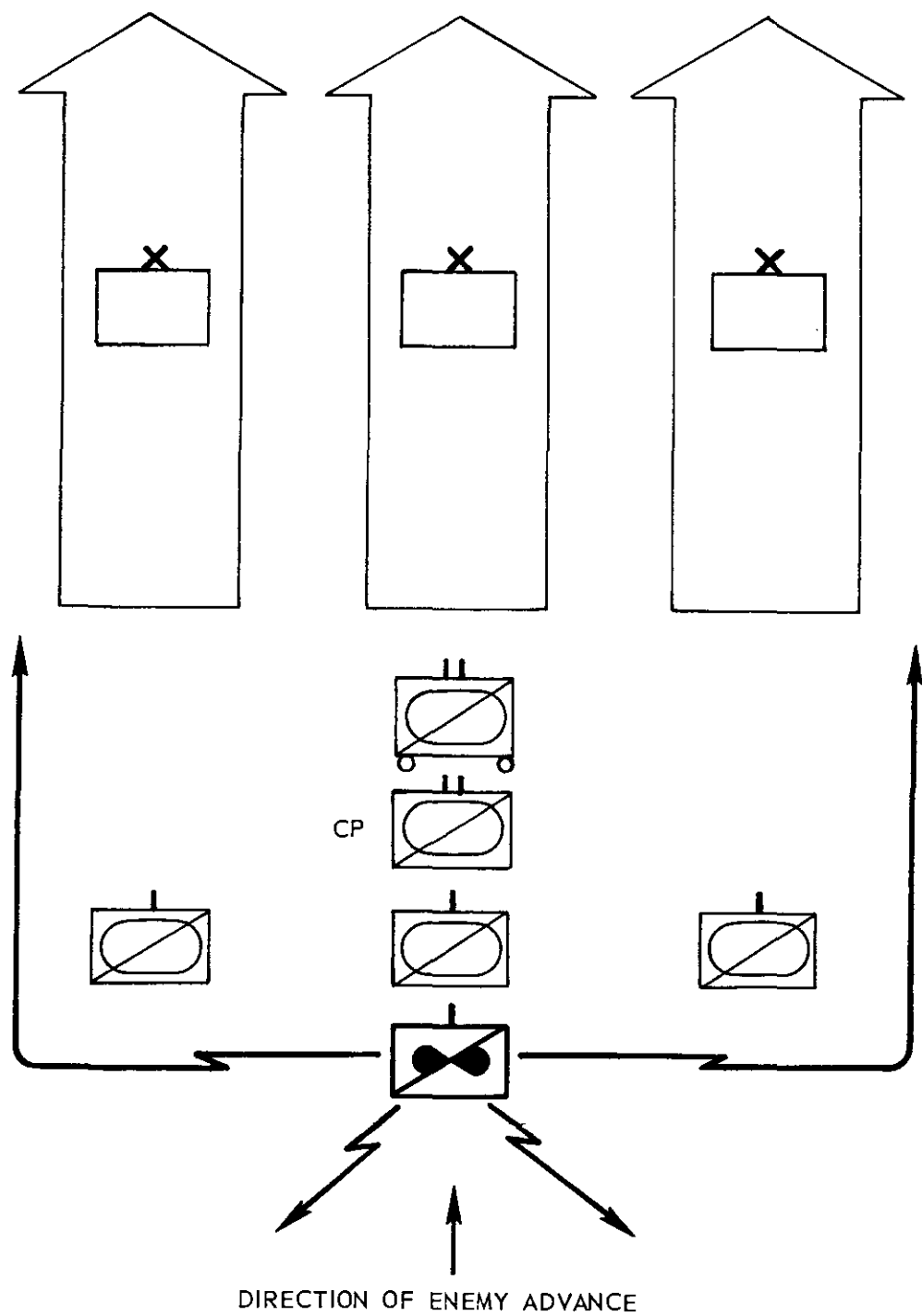


Figure 7. Rear guard.

contact points, coordinating points, and routes of withdrawal.

- (3) *Security.* The commander plans for flank security and reconnaissance to the front and flanks of occupied delaying positions. The enemy must not be permitted to bypass the rear guard and attack the rear of the main body. One or more subordinate units may be assigned to reconnoiter an area to the front or flanks of a position. Normally, however, rear guard units are assigned the additional mission of protecting the flanks and extending reconnaissance forward of the delaying position. Air vehicles enhance the effort of the rear guard by facilitating control and communication and extending observation to the front and flanks. The organic ground radar sets may be used to augment security to the front or flanks. Air cavalry elements may be employed to maintain contact with the main body and to prevent the enemy from bypassing the rear guard and attacking the rear of the main body. Air cavalry elements may establish an air screen to the front and flanks of the rear guard to warn of enemy approach.
- (4) *Supporting elements.* The rear guard commander, in coordination with the artillery representative, develops the plan of fire support for the operation. The plan of fire support includes planned artillery fires (nuclear and nonnuclear), tactical air, and the fires of organic weapons. Frequently, engineers are attached to or placed in support of the rear guard. The rear guard commander, together with the engineer unit commander plans to construct obstacles to delay the enemy.
- (5) *Coordination with the main body.* Liaison must be maintained with the main body to regulate withdrawal of the rear guard. The rear guard commander must be thoroughly familiar with the plan of the main body and have continuous communication with the main body commander so that

both commanders are informed of any situations that affect withdrawal of the rear guard.

c. The rear guard follows the main body, occupying successive delay positions or at a prescribed time interval or distance. When contact with the enemy has been made or is imminent, the rear guard occupies each delaying position until the main body has cleared the next delaying position. If the main body is moving rapidly and no contact is made with the enemy, the rear guard may move at a given rate behind the main body. It regulates its speed to stay the prescribed distance behind.

d. The rear guard engages enemy forces that threaten the rear of the main body. It fights to insure that the enemy does not impede the movement of the main body. The rear guard fights a delaying action, trading space for time until the main body has moved beyond the range of effective enemy action. When contact with the enemy has been made, it is maintained until the enemy is no longer a threat to the main body or has moved out of the area of responsibility.

108. Rear Area Security

a. *General.* A rear area security force protects rear area units, installations, and routes of communication (all routes, land, sea and air, along which supplies and replacements move) from attack by enemy airborne and air-landed forces, irregular forces, and infiltrators. The rear area security force commander must coordinate with combat and other elements in the area. He should avoid stereotyped operation of patrols, observation posts, and listening posts in regard to time, areas, and patrol routes. See chapter 12 for the conduct of rear area security operations.

b. *Securing Lines of Communication.* The techniques of guarding lines of communication vary with the terrain, road net, length of the lines of communication, and the type of enemy activity expected. The following techniques form the basis for plans to secure lines of communication.

- (1) If the lines of communication to be secured extend a short distance, subordinate units of the rear area secur-

ity force may be assigned areas of responsibility. Small security forces are placed on dominating terrain features overlooking likely avenues of enemy approach along the route. The commander maintains a centrally located and highly mobile reserve to counter enemy threats that develop.

- (2) If the lines of communication are long and must be guarded over a great distance, both flanks of the route are covered by a series of observation posts. These observation posts warn of enemy approach. Air vehicles or air cavalry elements may be employed to provide early warning. The remainder of the rear area security force may be employed to patrol the line of communication and escort vehicles moving through the area, or it may be positioned as small reserves at locations along the route of communication. The security force commander must control reserve groupings so that he can employ them singly or in mass. Plans must be prepared to commit the reserve in likely areas of enemy activity. Air vehicles may be employed to increase the mobility of dismounted elements of the reserve.

c. Protecting an Installation. An installation in the rear area may be of such importance as to warrant protection beyond the capability of the local commander operating the installation. Additional forces should be attached to the local commander for this purpose. An alternative, the commander of the rear area security force may be charged with the responsibility of the installation defense. In this case the local installation commander would be relieved of this responsibility.

d. Security Against Airborne, Airmobile, and Irregular Force Attack.

- (1) When protecting a rear area against enemy airborne, airmobile, or irregular forces, the commander deploys his troops to best counter the enemy threat. The commander reconnoiters the area and selects likely drop zones for airborne forces, landing areas for airmobile forces, and potential assem-

bly areas for irregular forces. He establishes observation posts to view likely drop zones, landing areas, and areas where irregular forces may assemble, and he patrols the area. Whenever possible, a small reserve is retained in a central location, prepared to move rapidly to any part of the area. When the size of the area and lack of troops preclude the holding of a reserve, threatened areas are reinforced by security forces in proximity to the threatened area that is not actively engaged with the enemy.

- (2) The key to success against airborne or airlanded forces is rapid deployment and the placing of maximum fires on the airborne or airmobile forces during the early phases of the landing. Consequently, movement to attack enemy forces is of paramount importance and piecemeal commitment may be required.
- (3) Action against irregular forces includes defensive actions to prevent or minimize their effectiveness, and offensive actions to destroy them. Irregular forces should be detected early, taken under fire, and attacked rapidly to destroy them.

e. Air Vehicles or Air Cavalry Elements. If available, these units may be employed to perform air reconnaissance of the area and reconnoiter likely landing areas for airborne and airmobile forces. The capability of air cavalry units to move at relatively high speed without regard to terrain obstacles should be used to the maximum to locate rapidly, destroy within their capability, and maintain contact with enemy forces once their presence is known or suspected in the rear area.

109. Security Against Nuclear and Chemical Attack

Armor units obtain security from nuclear and chemical attack by dispersion, consistent with efficient conduct of operations, active use of their inherent mobility, construction and use of protective shelters and field fortifications, individual protective clothing and equipment, marking and avoiding contaminated areas,

training in individual and collective protective measures, and decontamination. For details see appendix XXIV.

110. Security Against Covert Threats

Security against hostile threats of espionage, sabotage, and subversion is best provided by effective counterintelligence operations (FM 30-7). Because the principal covert threats to

security are espionage and sabotage, security measures to counter these activities must be emphasized. These measures include training of all individuals in the safeguarding of information and other aspects of personnel control and security; the control of personnel movement and communication; physical protection of sensitive areas, installations, and individuals; and the fostering of friendly relations with the civil population.

CHAPTER 6

LOGISTICS

Section I. GENERAL

111. Purpose and Scope

This chapter provides guidance to commanders and staffs of armor units below division level in logistical support operations, including supply, medical treatment and evacuation, transportation, maintenance, and services in an active theater of operations. It also outlines command and staff logistical responsibilities.

112. Principles of Logistics

Logistics is the part of administration that provides for and manages supply, and evacuation and hospitalization, transportation, maintenance and service. Although procedures may vary at different echelons, the principles of logistics remain constant and are applicable to all forms of warfare. However, the mass destruction of personnel, supplies and equipment in chemical, biological and nuclear attack requires that additional consideration be given to applying these principles. For discussion of these considerations, see FM 54-2. All echelons in the logistical structure adhere to four basic principles.

a. Logistics Is a Function of Command. Commanders at all echelons are responsible for the logistical support of organic and attached elements of their commands. From the tank commander or squad leader upward, each commander assures himself that logistical support is adequate by anticipating his requirements, making his wants known, and employing properly the logistical elements available to him. The logistics officer (G4/S4) assists the commander in executing his logistical responsibility. To insure an active, well-coordinated effort, the commander makes his policies and decisions known to his logistics officer.

b. The Impetus of Logistics Is From Rear to Front. All logistical echelons must be im-

pressed with the necessity for constantly pushing the logistical support forward to the user to provide him the means to accomplish his missions. At all echelons, logistical support agencies must be in reasonable reach of the organic transportation of lower units. This is especially important in armor operations, which normally extend over great distances.

c. Advance Planning Is Essential to Successful Logistical Support. The logistical plan is based upon and provides adequate and timely support to the tactical operation. It is complete, simple, and flexible. It must be prepared with foresight and coordinated with all appropriate staff officers. Logistical and tactical planning are concurrent. The logistics officer advises the commander on all logistical matters pertaining to anticipated operations.

d. Reserves of Supplies Are Maintained at All Echelons. Certain reserve supplies, including rations, ammunition, fuel and lubricants, and repair parts, are carried by all echelons. These reserves insure that the combat units can continue to operate if the supply chain should be broken temporarily; they must be replenished when supplies become available.

113. Logistical Characteristics of Armor Units

a. Battalion, squadrons, and separate companies and troops are logistically capable of operating independently for limited periods of time. Companies of tank battalions and troops of armored cavalry squadrons are dependent upon the parent unit for logistical support.

b. Headquarters and the headquarters and headquarters companies of the armored division brigade, separate armored brigade and armor group contain only the personnel and equipment required to establish and maintain

the headquarters and the company logistically. These units do not have organic logistical elements required to support attached combat battalions or combat support units. For logistical elements of the armored cavalry regiment, see FM 17-95.

c. From a logistical point of view, armor units are characterized by their large consumption of fuels, heavy expenditures of ammunition, and maintenance effort. The success of the armor unit is much dependent on how well these requirements are satisfied.

Section II. DUTIES OF LOGISTICAL PERSONNEL

114. General

a. At brigade and battalion levels, the commander is provided a logistical staff officer (S4) and other key logistical personnel to assist him; at company level, the commander is provided trained enlisted men whose primary duties are concerned with logistical matters.

b. For a complete discussion of the commander's logistical responsibilities, see FM 54-2.

115. Brigade and Armor Group Logistical Personnel

The divisional brigade and armor group are primarily tactical headquarters and they normally enter logistical channels only to coordinate and establish priorities for critical items of supply. However, the commander must insure adequate logistical support for the subordinate elements. Higher headquarters attaches or places in support the logistical means to support operations. The commander is provided a staff to monitor the logistical situation, control and coordinate logistical elements, and recommend adjustment of logistical support means, as necessary.

a. *Duties of the S4.* The S4 keeps the commander informed of the logistical situation and supervises logistical activities. He does *not* receive, store, or issue supplies. The functions of the S4 are as follows:

- (1) Advises the commander and staff of the status of the logistical situation for current and future operations.
- (2) Controls the movement of, and provides protection for, supply convoys on the MSR or axis of supply and evacuation as appropriate.
- (3) Coordinates with subordinate unit S4's and the logistical control facility of the higher headquarters.

- (4) Receives reports from subordinate units on their supply and maintenance status, and forwards them to higher echelons, normally without consolidation.
- (5) Coordinates, displaces, and exercises tactical control of the logistical support elements attached or in support of the unit and provides security and protection for these elements.
- (6) Monitors the operations of logistical support elements operating in the trains to insure that continuous and adequate logistical support is provided.
- (7) Assumes staff responsibility for procurement and distribution of supplies in the unit if conditions preclude direct supply of subordinate units by supporting supply agencies.
- (8) Exercises full operational control over attached logistical support elements when the brigade of the armored division is organized for an independent mission.
- (9) Prepares area damage control plans.

b. *Logistical Duties of Other Staff Officers.* Other staff officers with logistical duties are the surgeon, communication officer, chemical officer, aviation officer, assistant S4, and food advisor. For the duties of these officers in the brigade and regiment, see FM 17-30 and FM 17-95.

116. Battalion or Squadron Logistical Personnel

a. *General.* Within the division the normal chain of logistical support is direct from division support command elements to the battalion or squadron. The commander is provided with a logistics staff officer and other key logistics personnel to assist him.

b. *Logistics Officer (S4)*. The logistics officer (S4) is responsible to the commander for the formulation of logistical policy, and for planning, coordinating, and supervising the logistical effort. The S4 is a logistical operator at this level. His duties are generally as described for the G4 in FM 101-5 and include—

- (1) Advising and keeping the commander informed on logistical matters.
- (2) Planning, coordinating, and supervising supply, maintenance, and evacuation.
- (3) Coordinating with the higher headquarters on logistical matters.
- (4) Assisting subordinate commanders with logistics matters.
- (5) Controlling the battalion/squadron combat trains.
- (6) Submitting logistical reports as directed.
- (7) Accomplishing area damage control planning.
- (8) Preparing paragraph 4 of the operation order.
- (9) Exercising staff supervision over receiving, storing, and issuing supplies.

c. *Surgeon*. The surgeon is both a special staff officer and commander of the battalion/squadron medical section. His duties include—

- (1) Keeping the commander and interested staff officers informed of the medical situation.
- (2) Recommending locations for the aid station, and controlling its operations.
- (3) Preparing a medical plan, based on the tactical situation and the plans of the commander, and coordinating this plan with the S4 to insure that it is in consonance with the overall logistical plan.
- (4) Planning for and supervising the evacuation of casualties to the aid station and, when required, from the aid station to supporting medical installations.
- (5) Procuring medical supplies.
- (6) Supervising preparation of reports on and maintaining records of the sick and wounded.

- (7) Supervising the technical and tactical training of the medical section.

d. *Maintenance Officer*. The battalion/squadron maintenance officer is both special staff officer and commander of the battalion maintenance platoon. His duties include—

- (1) Keeping the commander and S4 informed of the status of maintenance and evacuation of equipment, except signal and medical.
- (2) Recommending to the commander and coordinating with the S4 the composition and employment of maintenance elements.
- (3) Preparing a vehicle evacuation plan, based on the tactical situation and the plans of the commander, and coordinating this plan with the S4 to insure that it is in consonance with the overall logistical plan.
- (4) Efficient operation of the maintenance facilities of the unit to keep equipment in the most efficient operating condition.
- (5) Maintaining liaison with the subordinate elements of the units to insure that maintenance activities are coordinated.
- (6) Coordinating with higher maintenance echelons.
- (7) Supervising the recovery and evacuation of vehicles from the battlefield.
- (8) Supervising the tactical training of the maintenance platoon.
- (9) Supervising the technical training of all maintenance personnel, except communication and medical personnel, and monitoring training in vehicle operation and maintenance for drivers and crews of the battalion/squadron.
- (10) Procuring repair parts and maintenance supplies, except signal and medical.

e. *Automotive Maintenance Technician*. The automotive maintenance technician (a warrant officer) is the principal assistant to the maintenance officer. In the armored cavalry squadron the automotive maintenance technician supervises the squadron vehicle maintenance section of the squadron maintenance platoon.

f. Aircraft Repair Technician. In the armored cavalry squadron, an aircraft repair technician (warrant officer) supervises air vehicle maintenance. His duties include—

- (1) Supervising the squadron aircraft maintenance section.
- (2) Informing the squadron maintenance officer on the status of air vehicle maintenance and repair parts supply.
- (3) Supervising second-echelon air vehicle maintenance performed by the squadron aircraft maintenance section.
- (4) Test flies air vehicles on which complete service checks are performed by the section.
- (5) Provides technical assistance to the air cavalry troop.

g. Communication Officer. The battalion/squadron communication officer is both a special staff officer and the commander of the communication platoon. His logistical duties include—

- (1) Keeping the commander and the S4 informed of the status of signal maintenance and evacuation.
- (2) Maintaining contact with subordinate elements and supporting signal elements to insure that signal maintenance supply activities are coordinated.
- (3) Procuring and maintaining repair parts and components.

h. Support Platoon Leader. The battalion/squadron support platoon leader commands the support platoon. His duties include—

- (1) Controlling the field trains.
- (2) Insuring that the organic cargo transportation is loaded with fuel and lubricants, ammunition, and rations in accordance with instructions from the S4.
- (3) Functioning as the ammunition officer.
- (4) Organizing the internal security of the field trains.
- (5) Training the support platoon.
- (6) Maintaining communication with the higher headquarters logistical control facility.
- (7) Coordinating employment and locations of the mess teams.

i. Transportation Section Commander. The transportation section commander (lieutenant), commands the transportation section in the battalion/squadron support platoon. His duties include—

- (1) Supervising the hauling of cargo and movement of personnel in vehicles of the transportation section.
- (2) Supervising the selection and training of personnel in his section in the operation, maintenance, and employment of cargo vehicles.
- (3) Instructing and supervising in the proper loading of cargo.
- (4) Directing the movement of supply vehicles in convoy.
- (5) Conducting inspections to determine vehicle and load conditions and insuring compliance with prescribed procedures.
- (6) Advising the support platoon leader on motor transport problems.

j. Supply Section Leader. The battalion/squadron supply section leader (warrant officer) commands the supply section of the support platoon. His duties include—

- (1) Maintaining records to reflect the current logistical situation.
- (2) Preparing requisitions and other logistics documents.
- (3) Preparing logistical reports.
- (4) Assists the support platoon leader in the operation of the field trains.

117. Company or Troop Logistical Personnel

a. The key logistical personnel at the company/troop level include supply, communication, and maintenance noncommissioned officers who perform or supervise the functions of supply and maintenance.

b. Normally the company/troop executive officer is responsible to the commander for the supervision of all logistical matters of the unit. This does not preclude the assignment of other unit staff officers as assistant supply or maintenance officers.

c. In the air cavalry troop, a service platoon commander supervises all troop maintenance and supply activities.

118. Separate Company or Troop Logistical Personnel

a. The separate company-level armor units are organized to operate without battalion/squadron-level support. These units have organic mess teams. In addition to the personnel listed in paragraph 117, the separate unit has an automotive maintenance technician (war-

rant officer) who performs the duties of unit motor officer.

b. The separate armored cavalry troop has four organic air vehicles. Personnel who maintain these air vehicles include the crew chief assigned to each air vehicle and the helicopter mechanics in the troop maintenance section. The aeroscout section leader supervises the air vehicle maintenance performed in the troop.

Section III. BRIGADE TRAINS

119. General

The brigade trains consist of a control group, elements and units of the division support command attached to or in support of the brigade, and the field trains of units attached to the brigade. These trains are established to provide adequate logistical support to the tactical elements of the brigade and to control, coordinate movement, and protect the supporting elements and unit field trains.

120. Organization for Control

The brigade trains are organized under the tactical control (movement, security, and location) of the brigade S4. The S4 section establishes the control element of the brigade trains, which is known as the brigade logistical control point (BLCP). Movement of all logistical elements is coordinated at this point.

121. Composition and Employment

The composition of the brigade trains varies, depending upon the tactical situation and the type and number of units attached or in support of the brigade. For a discussion of the composition and employment of brigade trains, see FM 54-2.

122. Brigade Trains Under Division Control

In certain situations, as in the initial phase of a penetration or a deliberate river crossing or when route space is at a premium, it may be advantageous to place the brigade trains under the division support command commander, who then becomes responsible for their movement and protection. However, brigade trains, when so attached, should be kept as a unit and not positioned together and moved as a serial. The retention of brigade trains as a unit greatly improves their logistical efficiency, particularly when they are released to brigade control.

Section IV. BATTALION OR SQUADRON LOGISTICAL ELEMENTS AND TRAINS

123. Battalion (Squadron) Logistical Elements

There are three basic logistical elements organic to the tank battalion and armored cavalry squadron: the support platoon; maintenance platoon; and medical section. The size and composition of these elements vary depending on whether the parent unit is a tank battalion or armored cavalry squadron and depending on the major command to which the unit is assigned (division, regiment, or separate brigade). The functions performed by the logistical elements are identical, regardless of the unit to which organic.

a. *Support Platoon.* The support platoon of division and separate brigade armor units is organized with a platoon headquarters, transportation section, mess section, and supply section. In the armored cavalry regiment, mess elements are organic to each troop and battery.

(1) *Transportation section.* The transportation section is organized and equipped with the personnel and trucks to transport supplies from supporting supply or distributing points to the companies/troops of the battalion/squadron. The section normally transports a part of the unit

basic load of ammunition and prescribed loads of fuels and lubricants.

- (2) *Mess section.* The mess section is organized and equipped to receive class I supplies and prepare and deliver meals or rations to all units of the battalion. The cellular organization of the mess section permits the attachment of a mess team to each company or troop when required.
- (3) *Supply section.* The supply section is organized and equipped to receive supply requests, except for repair parts, from the companies/troops, and prepare and forward battalion requisitions or requests to the appropriate agency. Upon receipt of supplies, this section stores (if required) and distributes the supplies in the battalion.

b. Maintenance Platoon. The maintenance platoon is equipped and trained to perform organizational (second-echelon) maintenance, to provide repair parts, (except signal and medical) and to accomplish battlefield equipment recovery and evacuation. The maintenance platoon of the division and separate brigade armored cavalry squadrons is organized with a squadron vehicle maintenance section to provide backup second-echelon maintenance for surface vehicles and a squadron aircraft maintenance section to provide backup second-echelon air vehicle maintenance for air vehicles of the squadron.

c. Medical Section. The medical section is composed of medical commissioned and non-commissioned officers, aidmen, and aid station personnel, together with their equipment and transportation. The battalion surgeon commands the medical section and serves on the special staff of the battalion commander. Medical sections are organized with men, equipment, transportation, and communication facilities to provide emergency medical treatment *within their capabilities*. Medical sections evacuate casualties to the battalion aid station, either for evacuation to the rear or for treatment and return to duty. In combat operations, the battalion/squadron medical section will habitually attach a medical aid-evacuation team to each company/troop.

d. Communication Platoon. The communication platoon is normally located in the command post area. It provides backup second-echelon signal maintenance and signal repair parts for the battalion and technical signal advice to supply personnel.

124. Battalion or Squadron Trains Organization

The organization of trains varies with the mission, tactical and administrative situations, and such other factors as terrain, weather, and time and space. The trains may be organized as unit trains, with all logistical elements grouped directly under the S4, or as combat and field trains (pars. 132-136).

a. Combat trains are organized to provide *immediate logistical support for the combat operation* and consist of supply, medical, and maintenance vehicles, personnel, and equipment.

b. Field trains consist of administrative, supply, medical, and maintenance vehicles, personnel, and equipment *not included in the combat trains and not required for the immediate support of combat operations*.

125. Composition of Battalion (Task Force) or Squadron Combat Trains

The composition of the battalion combat trains is variable, depending on the tactical and administrative situations and such other factors as terrain, climate, road nets, and location of field trains. In slow-moving operations, the bulk of maintenance and medical facilities and a minimum number of supply vehicles are normally located in the combat trains. In such situations, the field trains are positioned close enough to the combat elements to supply them daily. In fast-moving operations such as an exploitation, it is desirable to place the bulk of organic logistical support elements in the combat trains since the location and disposition of the field trains will normally preclude their issuance of supply on a daily basis to the combat elements. Regardless of the trains area from which supplies will be issued to the combat units, it is desirable to maintain sufficient supply vehicles for simultaneous dispatch to the company teams/troops. When road space is

limited, higher headquarters may restrict the size of battalion combat trains.

126. Composition of Battalion or Squadron (Task Force) Field Trains

The factors used in determining the composition of the battalion combat trains also apply to the battalion field trains. Battalion field trains consist of these logistical elements not included in the combat trains and *not required for the immediate support of combat operations*. Generally, field trains include kitchen, ration, administrative, fuel and lubricant, and ammunition vehicles. *Appropriate elements of the maintenance platoon and medical section may be a part of the battalion field trains to*

provide maintenance and medical support for other field trains elements.

127. Control of Battalion (Task Force) or Squadron Trains

Control of the battalion trains, when employed either as a unit or as combat and field trains, is the responsibility of the battalion S4. The battalion combat trains are located in the area of, but not near, the battalion command post and are under the direct control of the battalion S4. The battalion support platoon leader, as the assistant S4, directly controls the battalion field trains, which are normally located in the trains area of the next higher command.

Section V. COMPANY AND TROOP LOGISTICAL ELEMENTS AND TRAINS

128. Organization of Company and Troop Logistical Elements

The organization and equipment of logistical elements organic to the different armor company-size units are not standard but vary in each TOE according to the mission of the unit.

a. Tank Company and Armored Cavalry Troop. Tank companies and armored cavalry troops organic to divisional battalions/squadrons have two basic logistical elements: a maintenance section and a supply element. The organic elements provide organizational maintenance and company-level supply support to the company/troop and any attached units. Mess support, backup second-echelon maintenance, medical, and supply and transportation support are provided by the parent battalion/squadron or unit to which attached. In the airborne division, the company/troop logistical elements have limited ground mobility means and, during sustained ground operations, require an augmentation of cargo vehicles to attain full mobility.

b. Air Cavalry Troop. The air cavalry troop of the armored cavalry squadron has an organic service platoon. The service platoon is organized with a maintenance section to provide organizational maintenance, and a supply section to provide troop-level supply, including transport of ammunition, fuels, and lubricants. The air cavalry troop is dependent on the parent squadron for mess support. In the airborne division, the troop service platoon is pro-

vided limited transport means and requires an augmentation of cargo vehicles during sustained operations.

c. Headquarters and Headquarters Company/Troop.

- (1) The battalion headquarters and headquarters company and the squadron headquarters and headquarters troop contains organic logistical elements to provide logistical support for the unit as a whole. See paragraphs 123 through 127 for a discussion of battalion/squadron logistical elements.
- (2) Brigade headquarters and headquarters company contains organic maintenance, medical, mess, and supply elements required for normal company administration. The maintenance element of the headquarters contains the personnel and equipment necessary to perform second-echelon repair and maintenance on all troop equipment except air vehicles. The crew chiefs of the brigade aviation section perform second-echelon maintenance of air vehicles, supervised by a senior air vehicle mechanic. The brigade surgeon and medical aidman provide limited medical treatment for the brigade headquarters and headquarters company. The brigade headquarters and headquarters company does not contain the logistical units to support the brigade as a whole.

129. Company or Troop Train

a. The company/troop train consists of organic and attached logistical elements. The company/troop train may be employed as a unit train or organized into a combat train and a field train. The factors considered in determining the composition of trains are discussed in paragraphs 123 through 127.

b. A company/troop detached from the parent battalion/squadron will have attached to it a proportionate share of the battalion/squadron logistical support. The attachments will normally include ammunition, fuel, and lubricant supply vehicles, a company or troop mess team, and a medical aid-evacuation team. Additional medical aidmen and equipment and a supply of fast-moving repair parts may accompany a detached unit. Upon joining the unit to which attached, the company/troop commander will organize the company/troop train to support the combat operation. The organic and attached logistical elements *not required for immediate support of the combat operation* become a part of the trains of the higher headquarters.

c. An important consideration in company/troop level logistics is that each vehicle in the unit carries its prescribed load of rations, fuels, and lubricants, its authorized repair parts; and its part of the basic load of ammunition, as appropriate.

130. Composition and Employment of Tank Company Train and Armored Cavalry Troop Train

a. The tank company and armored cavalry troop normally organize a combat train and a field train. In some situations, dispersed operations preclude the echelonment of the train and require the employment of a unit train.

- (1) *Company/troop combat train.* The company/troop combat train consists of the maintenance section and the attached medical aid-evacuation team, together with any supply vehicles that may be attached from the parent unit support platoon that are required for the *immediate support of the combat operation*.

- (2) *Company/troop field train.* The company/troop field train consists of the personnel and equipment *not located in the company/troop combat trains and not required for the immediate support of the combat operations*.

b. The company/troop combat train remains with the company/troop under the control of the executive officer. In fast-moving situations, the combat train normally moves as a part of the combat formation to gain security from its proximity to combat elements. In a slow-moving situation, the combat train follows the combat elements by bounds, taking advantage of cover and concealment.

c. The company/troop field train normally moves with the trains of the parent unit or the unit to which attached. When operating under parent battalion/squadron control, the company/troop field train usually becomes a part of the battalion/squadron field trains. When operating with a mechanized battalion or infantry battalion, fuel and ammunition vehicles attached to a tank company or armored cavalry troop from the parent unit may move with the battalion combat or battalion field trains.

131. Composition and Employment of Air Cavalry Troop Train

a. *General.* The air cavalry troop train consists of the personnel and equipment of the troop service platoon together with any attached logistical elements. The air cavalry troop organizes an air train and a ground train to support troop combat elements. The size and composition of the air train and ground train will normally depend upon the size of the combat element to be supported, the extent of operations, and the distance of the combat elements from the troop train areas.

b. *Air Echelons.* The air cavalry troop may employ an air train to provide responsive logistical support to the troop combat elements. The air train consists of the two utility air vehicles organic to the service platoon together with their assigned crews and designated loads. The designated loads may consist of maintenance personnel and repair parts, attached medical personnel, ammunition, or externally carried fuel containers. Actual loads are based on es-

timated requirements to support specific missions. The air train may be located with the ground train or at a predetermined area from which it moves to rendezvous with the combat elements to accomplish supply, maintenance, or evacuation functions. Rendezvous points and times may be predetermined or the air train may stand by to rendezvous with the troop combat elements on an on-call basis.

c. Ground Echelon. The air cavalry ground train consists of the organic and attached ground logistical vehicles and the logistical personnel, equipment, and supplies not included in the air train. The ground train may be organ-

ized and employed as a unit train or echeloned into a combat train and field train as discussed for the company/troop train in paragraph 129. The air cavalry troop unit or combat train is normally employed under the control of the service platoon and is located where it can best support the combat elements of the troop (i.e., air cavalry troop assembly area, squadron combat trains area, or a ground troop combat train area). The field train, when organized, normally becomes part of the squadron field trains. Air vehicles may return to the train areas for fuel and ammunition supply, or ground vehicles may be dispatched to rendezvous points for supply functions.

Section VI. EMPLOYMENT OF TRAINS

132. General

The major considerations in the employment of trains are—

a. Logistical Support to the Combat Units. In all situations, the trains are organized and positioned to provide adequate and timely supplies, medical evacuation, and maintenance support to the combat unit. The trains of the higher echelons are oriented on and convenient to the location of subordinate units. The movements of trains are based on the movements of the combat units to insure continuous and responsive support.

b. Minimum Interference With Tactical Operations. The location and movement of logistical support vehicles must be integrated with the planned location and movement of combat units. Logistical activities and vehicular traffic must not impede a combat unit's freedom of action.

c. Security and Protection to Elements of the Trains. Trains should be employed in areas and on routes that have been cleared of enemy by the combat units. Ideally the area should provide natural passive protective means such as barriers, cover, and concealment. Trains should be located to take advantage of the protection afforded by the disposition of combat units. In certain situations, it may be necessary to assign combat elements to protect the trains.

133. Characteristics of Trains Areas

The desirable characteristics of an assembly area discussed in appendix XXV are applicable to trains area. Additionally, the trains area should be convenient to suitable routes to the combat units, subordinate headquarters trains, and the trains of the higher echelon.

134. Axis of Supply and Evacuation

a. The *axis of supply and evacuation* is a specified direction or route in relation to an axis of advance, zone of operations, or area of operations to be established for the supply, evacuation, and transportation of personnel and materiel.

b. The axis of supply and evacuation extends from a logical juncture with the main supply route (MSR) or axis of supply and evacuation of the next higher headquarters to a location convenient to subordinate elements. In offensive operations the axis of supply and evacuation may be projected forward as far as practical (fig. 8). The axis of supply and evacuation may be announced in the operation order or other appropriate means and will be changed by fragmentary order as often as necessary.

c. The headquarters designating the axis of supply and evacuation is responsible for security of the axis.

d. In defensive and retrograde operations, the axis of supply and evacuation should be

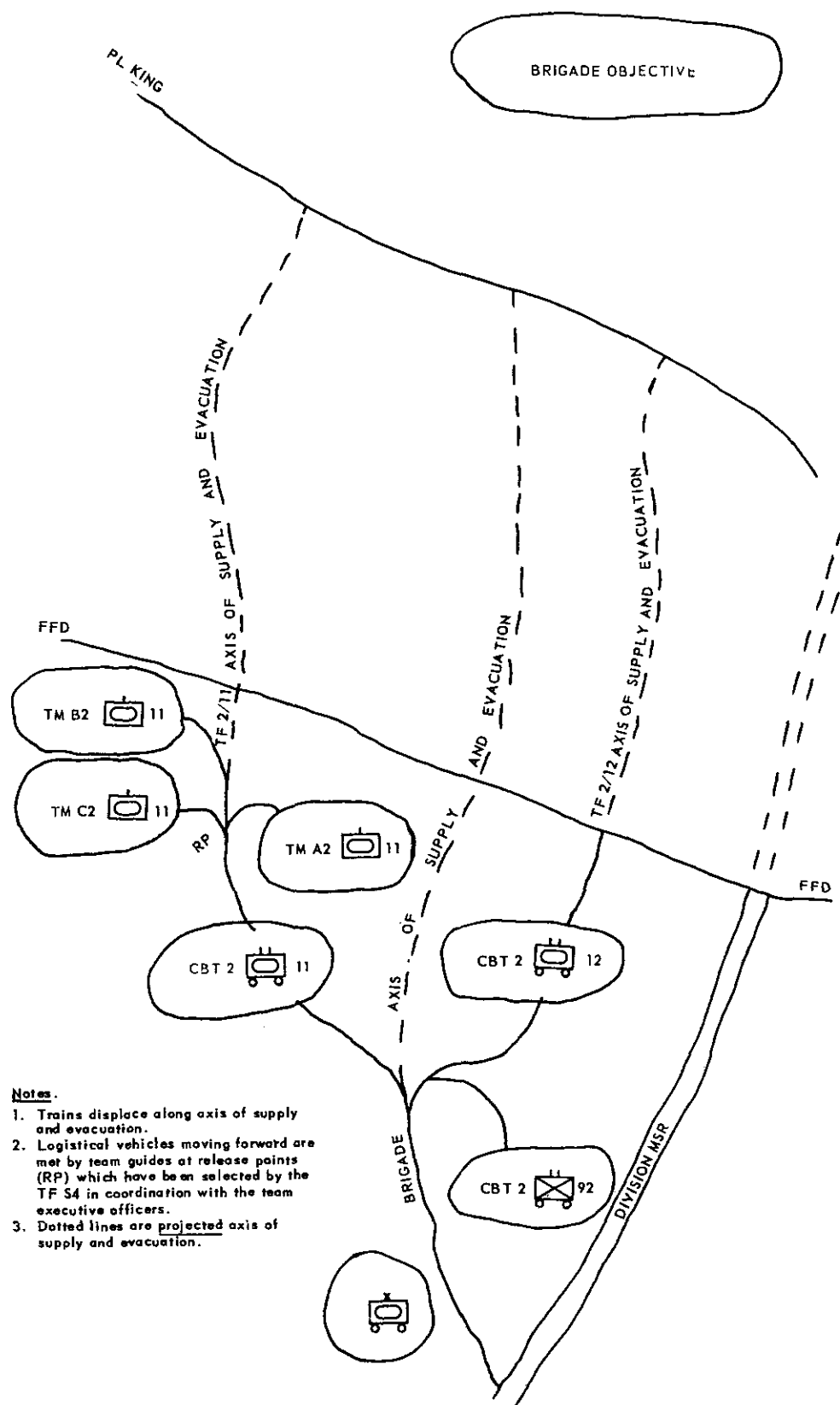


Figure 8. Axis of supply and evacuation, offense.

parallel to the expected or planned movement of subordinate combat elements.

135. Employment of Battalion (Task Force) or Squadron Combat Trains

a. In fast-moving tactical situations, continuous movement of the combat trains is required for responsive logistical support. In this type operation, the combat elements will soon pass beyond supporting distance of the combat trains if the trains are kept stationary. The continuous movement of the combat trains to keep up with the combat elements limits the performance of logistical support, particularly in maintenance, because of the lack of time and optimum operational conditions.

b. In a slow-moving tactical situation, the combat trains can remain stationary for longer periods, moving by bounds when the distance between combat elements and the trains becomes too great for timely support.

c. The combat trains are under the direct control of the battalion S4 for operations, movement, and security. The combat trains

provide their own local security. Normally, overall security is provided by locating the combat trains near the combat elements; however, in a fast-moving situation, it may often be necessary for combat elements to provide protection for the combat trains or make the trains part of the combat formation.

136. Employment of Battalion (Task Force) or Squadron Field Trains

The field trains normally operate in the trains of the next higher echelon. This assists in providing adequate logistical support to the combat elements and provides control and coordinated movement of and protection to the field trains. It further disperses and echelons logistical elements. The field trains are under the control of the battalion/squadron support platoon leader. In some situations, time and space may require that the field trains be located between the combat trains and the trains area of the higher echelon. In this case, the parent unit has full responsibility for security and movement of the field trains.

Section VII. LOGISTICAL SUPPORT OPERATIONS, BATTALION OR SQUADRON

137. Logistical Support During Marches

a. *Position of Battalion/Squadron Trains on the March.* On the march, the trains, less vehicles marching with the companies/troops or brigade, normally march as a unit near the rear of the formation.

b. *Supply of Class III on the March.*

- (1) On the march, fueling is normally accomplished during scheduled halts using 1 to 2 or combination of 2 methods (i.e., fueling from bulk fuel tankers or fuel cans). One or more fuel and lubricant vehicles from the support platoon may be placed in support of each company/team or troop. At halts, trucks move down the column, dropping off the required number of cans of fuel and lubricants at each vehicle, or bulk tank trucks will transfer fuel directly to vehicular tanks. Upon completion of refueling, the supply trucks are used for picking up

empty containers as the trucks return toward the rear of the column.

- (2) During halts when units coil up, fuel trucks may move from one vehicle to another in the area, or may form the basis of a gas-station method of refueling.
- (3) On extended marches in rear areas, empty fuel and lubricant vehicles replenish their loads at class III supply and distributing points often established by higher headquarters along the route of march. It is frequently possible for empty fuel vehicles to precede the column to these points to be refilled before the arrival of the main body.

c. *Messing on the March.* Halts for feeding should, if possible, coincide with scheduled halts. The tactical situation permitting, the kitchens may move with the quartering party so that meals can be prepared before the arrival of the unit at a predetermined location, or

they may march with the companies/troops, cooking en route so that hot meals can be served at prescribed halts or at the end of the march. If the tactical situation does not permit serving hot meals en route, small detachment rations or combat rations may be used.

d. Medical Service and Evacuation on the March. The battalion/squadron aid station usually marches near the rear of the formation. However, if the situation warrants, it may march with the headquarters. The surgeon places an aid-evacuation team in support of each company/troop. The medical aid-evacuation team, mounted in a frontline ambulance, marches near the rear of the company/troop column and is available for the evacuation of casualties to the battalion/squadron aid station. If necessary, ambulances evacuate casualties from aid station to the nearest medical installation.

e. Maintenance and Evacuation on the March.

- (1) When a warning order for a march is received, vehicles that cannot be repaired before the movement are evacuated to the supporting maintenance unit. If time does not permit evacuation, or if the vehicles cannot be moved, their location and condition are reported to the supporting unit.
- (2) The maintenance platoon marches near the rear of the battalion/squadron formation. Company/troop maintenance sections march with their respective units.
- (3) Vehicles disabled en route are moved to the side of the road so they do not interfere with the passage of the rest of the column. Personnel of the company/troop maintenance section will first attempt to repair inoperative vehicles; if unable to repair them, they will tow them to the destination. Vehicles that cannot be repaired or towed are left to be repaired or evacuated by the maintenance platoon. If maintenance or evacuation cannot be accomplished by the maintenance platoon, vehicles are left with their drivers or members of their crews, and

their condition and location reported to the supporting maintenance unit.

138. Logistical Support in Assembly Areas

In an assembly area, logistical operations are accomplished in accordance with available time and the tactical situation.

a. Supply. In an assembly area, first priority is given to the supply of ammunition, fuels and lubricants, rations, and water. If time is available—

- (1) All classes of items will be supplied. Requests for supplies are submitted to the appropriate agency; items to fill shortages are drawn and issued.
- (2) Supplies and equipment are checked to determine that prescribed and basic loads are on hand in proper condition.

b. Medical Service and Evacuation. Normally, personnel receive only first aid medical treatment in the assembly area. Persons requiring further treatment are evacuated by supporting ambulances to the nearest higher medical facility.

c. Maintenance. Maximum advantage must be taken of the time available in assembly areas to accomplish as much maintenance as possible. Drivers and maintenance personnel must realize that after they leave the assembly area, opportunities to perform maintenance will be limited. All commanders, vehicle crews, and maintenance personnel should do everything possible to insure efficient operation of equipment. Maximum effort should be devoted to maintenance checks and repairs that cannot be accomplished properly during periods of combat. Equipment should be inspected, cleaned, and put in the best possible condition. The commander may request assistance from supporting maintenance units. Materiel that the battalion/squadron cannot repair is evacuated or turned over, in place, to the supporting maintenance unit.

139. Logistical Support in Fast-Moving Offensive Operations

a. In an exploitation or pursuit, the battalion/squadron combat trains move with the battalion/squadron and are usually near the

end of the formation, where they gain security from their location between the forward combat elements and the rear guard. When the battalion/squadron becomes engaged, the combat trains move into an area that affords them cover and concealment and a degree of security by their proximity to combat elements.

b. In the exploitation, supply lines become much longer. Overcoming the problems of supply over greater distances requires detailed logistical planning. The accomplishment of this supply may require attachment of additional cargo transportation to the battalion/squadron from the higher logistical echelon, and the use of air vehicles. Increased protection for trains and supply convoys may be required. In rare instances, all of the battalion/squadron logistical elements may be located with the battalion and operate as unit trains.

c. Ammunition expenditures during an exploitation are usually light, while consumption of fuels and lubricants is heavy. To meet this increased need for hauling fuel and lubricants, kitchen equipment may be unloaded or consolidated in a few trucks and the empty kitchen trucks used to supplement the fuel and lubricant trucks.

d. Each vehicle should carry a minimum 5-day supply of either small-detachment or individual combat rations, rather than the normally prescribed 3-day supply.

e. The number of casualties from combat normally decreases, but one problem of medical evacuation increases—that of moving the wounded over longer distances. When possible, air vehicles are used for evacuation of casualties from the battalion/squadron aid stations or clearing stations to army medical installations.

f. During an exploitation, the percentage of vehicles lost to combat decreases with respect to other operations; however, the percentage lost through mechanical failure increases. The battalion/squadron maintenance platoon thus directs its efforts toward making minor repairs on the maximum number of vehicles, rather than major repairs on a few. Vehicles that cannot be repaired by the maintenance platoon are towed to the axis of supply and evacuation of the next higher headquarters and their loca-

tion and condition reported to the supporting maintenance element.

140. Logistical Support in Slow-Moving Offensive Operations

a. During a slow-moving offensive situation, the battalion/squadron combat trains move forward by bounds behind the combat elements. Movement should be screened from enemy observation. If the road net is limited, location of the combat trains at a point from which adequate logistical support is insured assumes increased importance.

b. Ammunition expenditures in a slow-moving offensive situation are high, contrasted with consumption of fuel and lubricants. Supply and transportation of ammunition must be emphasized.

c. Casualties are normally high during this type of offensive action, necessitating rapid evacuation by the supporting medical aid-evacuation team from the companies/troops to the battalion/squadron aid station. When attacking through a friendly unit, coordination should be made with the friendly unit surgeon to receive casualties from the attacking companies/troops. This will speed evacuation from the battlefield to a medical facility and assist the attacking battalion medical aid station to retain mobility.

d. Vehicular casualties are likely to be high; close and continuous maintenance support is essential. The techniques used in providing this support are discussed in paragraphs 157 through 164.

141. Logistical Support in Linkup Operations

a. Logistical support reinforcements may be greater in linkup operations than those for other offensive actions. Additional considerations for planning logistical support in linkup operations include the distance to the objective area, time the objective area is to be held, planned operations or movement out of the objective area, and the movement of the land tails of units participating in the airborne or airmobile assault.

b. The supply requirements for a linkup operation may exceed the transportation capa-

bility of the battalion/squadron support platoon. The battalion/squadron may have to request additional vehicles or supply by air. If they are not available, kitchen trucks and company/troop supply trucks may have to be used to haul ammunition and fuels.

c. In airborne and airmobile operations, priority for supply by air is given to the units assaulting the objective area. Supplies for the linkup forces normally move by land transportation. However, when the objective area is to be defended jointly by the linkup and airborne or airmobile force, supplies for the linkup force may be flown into the objective area and stockpiled to facilitate supply.

d. Evacuation of equipment and casualties may create major problems for the linkup force. If evacuation routes are open, the normal evacuation procedures apply. When ground routes are insecure, air vehicles may be used for evacuation of patients while damaged equipment may be carried forward with the linkup forces until a suitable opportunity for evacuation is available.

e. The land tails of airborne or airmobile assault units will normally move with the linkup forces. These elements move with the trains of the headquarters of the linkup force. When moving with a battalion/squadron, these elements march with the field trains.

142. Logistical Support in Defensive Operations, General

The logistical support of an armor unit must be flexible enough to support a defensive operation and to permit immediate change to the support of an offensive operation. This flexibility is especially important in the mobile defense. Defensive operations are normally characterized by relatively heavy expenditures of ammunition and light expenditures of fuel and lubricants. However, in the mobile defense, the expenditure of fuel and lubricants may become heavy, owing to the offensive characteristics of the operation.

143. Logistical Support in the Mobile Defense

The logistical support plan for the mobile defense must provide for alternate methods of

supply and medical evacuation, multiple routes of supply and medical evacuation to insure adequate support and avoid interference with the tactical maneuver, and rapid maintenance and evacuation of equipment. The logistical support of the security force, the fixing force, and the striking force must be adaptable to either the offense or the defense. Supply and medical evacuation by air are employed to supplement the normal ground means. Alternate locations are planned from which the combat trains can support the battalion/squadron in either an offensive or defensive maneuver.

a. *Logistical Support for Security Force.* Logistical support for the security force is similar to that for a unit in a delaying action (par. 146). The battalion/squadron trains may be augmented so that additional supplies are available should the unit be cut off by enemy action. Plans must be prepared for supply by air. Casualties are normally evacuated by air. Maintenance is necessarily confined to minor repairs. Frequently, time will not allow repair of disabled vehicles, and they must be evacuated quickly. If their capture is imminent, they must be destroyed.

b. *Logistical Support for Fixing Forces.* Detailed plans must be made for the logistical support of each blocking position, including multiple routes and alternate means of supply and medical evacuation.

c. *Logistical Support for Striking Force.* Logistical support for the striking force is planned to provide for the offense.

d. *Requirements on Logistical Personnel.* In the mobile defense, supply and maintenance personnel, often having to work in unsecured areas, are extremely vulnerable to attack and must be responsive to rapidly changing situations.

144. Logistical Support in the Area Defense

a. Battalion/squadron combat trains usually include only the medical section (minus the medical aid-evacuation teams with the companies/troops), and elements of the maintenance platoon required for the minor repair, recovery, and evacuation of vehicles. For security, supply vehicles and maintenance facilities should be located well to the rear. Fuel

and lubricant trucks normally are not needed forward because of the light expenditures of these supplies. If necessary, additional ammunition is stockpiled in the forward area. The size of battalion/squadron combat train is usually restricted. The bulk of the logistical elements should be in the field trains. Normally, complete supply is accomplished at night.

b. When mess trucks are used to transport rations to forward defense elements, they move from the field trains area under cover of darkness and then normally return to the battalion/squadron field trains before daylight.

c. The medical section aid-evacuation teams, equipped with frontline ambulances, evacuate casualties from the companies/troops to the battalion/squadron aid station. In some cases, dismounted litter bearers are required. Casualties are evacuated from the battalion/squadron aid station by elements of the supporting medical unit.

d. Personnel of the company/troop maintenance sections recover and evacuate disabled vehicles to the established maintenance collecting point, using organic recovery vehicles. Disabled vehicles that cannot be repaired by the battalion/squadron maintenance platoon are evacuated to the supporting division maintenance collection point.

145. Logistical Support in Retrograde Operations, General

Retrograde operations are characterized by heavy expenditures of fuel and lubricants. The nature of the operation may involve comparable expenditures of ammunition. All classes of supply are often prepositioned to insure continuous support for the combat elements since the supply chain is extremely vulnerable to enemy attack. Movement of supply vehicles is normally accomplished during periods of reduced visibility because of the enemy's superiority in combat power. Maintenance and recovery of damaged materiel is difficult since it is often performed in the face of enemy fire.

146. Logistical Support in the Delaying Action

a. In the delaying action, control and security of the logistical elements are vitally impor-

tant. The plan for the operation must provide for adequate support during movement to and occupation of each delaying position. The size of the battalion/squadron combat trains is held to a minimum.

b. Supply of the combat elements is accomplished immediately upon their arrival at selected delaying positions. As soon as practical, the battalion/squadron S4 or his representative directs the movement of battalion/squadron combat trains to the immediate rear of the next delaying position, where they can most effectively support the operation.

c. The battalion/squadron commander must give special consideration to demolitions and engineer class IV supply requirements. Transportation must be provided for these items, and they must be so located that they are readily available to the combat elements. It may be expedient to stockpile these items on successive delaying positions. This permits the early withdrawal of supply vehicles and provides additional time for the supply vehicles to replenish loads at supporting supply or distributing points.

d. The evacuation of casualties is generally the same as that in offensive or defensive operations. The aid station operates in the battalion/squadron combat trains area. If the medical aid-evacuation teams attached to the companies/troops cannot evacuate all casualties, it may be necessary to use company/troop vehicles and the armored ambulances from the medical section.

147. Logistical Support in the Withdrawal

a. Logistical plans in the withdrawal provide for the support of the main body and for security forces remaining in contact with the enemy. Logistical support for the main body is similar to that for a unit conducting a march (app. VI). Logistical support for the security force in the withdrawal is similar to that of the security force in the mobile defense (par. 143).

b. The logistical plan provides for evacuation or destruction of excess supplies and equip-

ment, except medical, in a manner not to compromise the plan of withdrawal. Medical supplies and equipment are not intentionally destroyed (FM 27-10).

148. Logistical Support in the Retirement

The logistical support of units conducting a retirement is as discussed for a unit conducting a march (app. VI).

Section VIII. SUPPLY

149. General

a. In the division, supplies are distributed to battalion/squadron and separate companies using a combination of supply point and unit distribution. The division support command delivers all classes of supply, except class V, down to the brigade trains and, whenever possible, directly to the using unit. Supplies delivered to the division by direct and general support units are delivered directly to the using units without transloading whenever possible. See FM 10-50 and FM 54-2 for a discussion of division supply procedures.

b. In battalion/squadrons, all supplies are delivered directly to the companies/troops.

c. The prescribed loads of fuel, lubricants, and repair parts carried by armor units are established by the field army commander. Basic loads of ammunition are established by the Department of the Army.

d. A request or requisition may be a complete, written, formal requisition on a specified form, an informal request in the message form, or an oral request. Although the terms are used interchangeably, each constitutes a demand on a supply activity for supplies or equipment. Throughout this section, the term *requisition* generally refers to the written formal requisition.

150. Class I

a. *Definition.* Class I supplies are items consumed at a uniform and predictable rate, irrespective of combat or terrain conditions, and require no adaptation to individual requirements. Class I supplies consist primarily of rations. Post exchange supplies issued on a gratuitous basis are also included in class I.

b. *Requests and Requisitions.* In the division, a formal requisition for class I supplies is not required. The division supply and transport battalion requests rations for the division,

based on estimated strength figures provided by the adjutant general, 72 hours before the time rations are to be delivered. Upon receipt, rations are broken down into battalion/squadron and separate unit lots based on personnel daily summaries submitted by each unit. In rapidly changing situations, it may be necessary for units to submit an informal request for the number of rations required to the supply and transport battalion. When a unit requires a specific type ration, it notifies the supply and transport battalion in advance.

c. *Distribution.*

- (1) In the division, battalions/squadrons and separate units use organic transportation to pick up rations at the division class I distributing point in the division support area or at the division forward distributing point in the brigade trains area. Rations are then broken down into company-size lots and delivered to the kitchens.
- (2) Mess personnel prepare rations in the trains area or on the move to serve hot meals whenever possible.

151. Class II

a. *Definition.* Class II supplies consist of supplies and equipment for which allowances are prescribed by such documents as tables of organization and equipment (TOE), tables of allowances (TA), prescribed load lists (PLL), or special lists or letters. Examples are clothing, weapons, vehicles, and repair parts.

b. *Requests and Requisitions.* Armor units normally enter combat with all authorized class II items. When a class II item is lost, destroyed, or worn out, the unit commander requests a replacement through the S4 or his representative by message. The supply section of the battalion/squadron support platoon consolidates class II requests for all units of a battalion/squadron and forwards the consoli-

dated request to the division supply office in accordance with the division SOP or administrative order. Requests or requisitions may be transmitted electronically or by messenger. Requisitions for regulated or command-controlled class II items must be forwarded through command channels.

c. Distribution.

- (1) Whenever possible, class II supplies delivered by the supporting army supply unit or facility directly to the requesting unit. When this is not feasible, they are delivered by the division supply and transport battalion to the field trains area of the requesting unit. In some situations, the requesting unit may be required to draw fast-moving class II items at the division class II and IV transfer or distribution point in the vicinity of the forward class I distributing point.
- (2) Distribution in battalion/squadron is made directly to the requesting company/troop. Distribution of class II items is normally accomplished at the same time rations, fuels, or ammunition is delivered. A large issue, such as changes from cotton to woolen clothing, is usually distributed when the unit is out of contact with the enemy. Requesting units may be required to furnish drivers for delivery of vehicles.

152. Class III

a. Definition. Class III supplies consist of fuel and lubricants for all purposes, except for air vehicles or for use in weapons. Class III supplies include gasoline, kerosene, diesel fuel, lubricating oil, grease, and solid fuels such as coal, coke, and wood. Fuel for air vehicles is classified as class IIIA.

b. Requests and Requisitions. No formal requisition is required for class III supplies. Empty class III containers presented at designated class III supply points or distributing points constitute a requisition. When a unit anticipates any change to previously experienced supply rates, a periodic forecast (an estimate of bulk and package products) is sub-

mitted to the division quartermaster supply section by radio, wire, or messenger.

c. Distribution.

- (1) Class III supplies are distributed to battalions/squadrons and separate units at division distributing points in the division support area, division forward class II distributing points in brigade trains areas, or designated rendezvous points. Units use organic cargo trucks and bulk fuel tanks to obtain fuels and lubricants from these supply points.
- (2) Battalion/squadron fuel and lubricant trucks are dispatched to companies/troops, where the supplies are delivered to individual vehicles. If it is not practical to deliver directly to the individual vehicles, supplies are hand-carried to the vehicle by the vehicle crews or vehicles are withdrawn from their positions and moved back to the location of the refueling vehicle. The class III trucks return to the battalion/squadron field trains area, where loads are redistributed. The empty vehicles are then dispatched to the appropriate supply or distributing point to be refilled.
- (3) The air cavalry troop uses organic vehicles to obtain class IIIA supplies from division distributing points or forward class III distributing points and to deliver supplies to individual air vehicles.

153. Class IV

a. Definition. Class IV supplies consist of items for which allowances are not prescribed. Examples of this class are construction, road-building, camouflage, and fortification materials; waterproofing supplies; and flame-thrower, cold-weather, and deep-fording kits. All classes of supply may be subject to class IV issue, or class IV control, when issued in excess of prescribed allowances.

b. Requisition and Distribution. Class IV requisitions normally require command approval. Battalions/squadrons submit requests for regulated items and items appearing on the-

command-controlled lists through command channels. Requests for class IV items not on these lists are submitted directly to the division supply office who in turn refers the requests for approval by the division commander. Once command approval is given, class IV supply is accomplished generally in the same manner as class II.

154. Class V

a. Definition. Class V supplies consist of ammunition, explosives, and chemical agents, including small arms ammunition; grenades; nuclear ammunition; mortar, tank, and artillery ammunition; mines and explosives (such as TNT blocks, fuzes, blasting caps, and detonators); pyrotechnics; and chemical agents and ammunition. Logistical personnel concerned with the supply of ammunition should be familiar with the terms *round of ammunition*, *required supply rate*, *available supply rate*, *basic load*, and *special ammunition load (SAL)*, which are defined in AR 320-5. Personnel concerned with supply of chemical, biological, and nuclear weapons should refer to FM 101-31 and FM 9-5.

b. Requisitions. Requisitions (transportation orders) are prepared by battalion/squadrons and separate units to replenish their basic load. Replenishment of the basic load in an active situation may be made concurrent with, in anticipation of, or after expenditure. Transportation orders must be validated by the division ammunition officer (DAO) before they are presented at any army supply point or mobile class V distributing point.

c. Distribution.

- (1) The normal source of class V supply is the supporting army ammunition supply point (ASP). When the tactical situation indicates that movement will be so rapid that the army ASP will not continually be within supporting distance, the division G4 may request a mobile ammunition distributing point from army to operate in the division area.
- (2) Supply of class V items is accomplished within combat units at every opportunity. The battalion/squadron

S4 sends ammunition trucks, containing mixed loads of ammunition, from the battalion/squadron combat trains directly to the combat vehicles of the companies/troops, tactical situation permitting. After supplying the combat vehicles, the trucks return to the battalion/squadron combat trains area. Here, remainders of loads are adjusted, and empty trucks are dispatched to the battalion/squadron field trains. Empty ammunition trucks are normally dispatched through brigade logistical control points, where they are formed into convoys for movement to the army ASP or mobile class V distributing point (if one is established). After the unit ammunition trucks are filled, they return to the battalion/squadron field trains area; then as, directed by the unit S4, they either remain in the battalion/squadron field trains or are sent forward to join the combat trains.

155. Water

Water supply is a function of supporting engineer units. Water points are established in the most convenient locations available consistent with security requirements. Units using organic transportation draw water from the nearest water point.

156. Repair Parts

a. Definition. Repair parts are any parts, assemblies, or components required for the maintenance of an end item.

b. Stockage.

- (1) Fast-moving repair parts are carried in each battalion/squadron and separate unit on the basis of a consolidated authorized organizational stockage list (CAOS) commonly referred to as a prescribed load. The prescribed load must be kept on hand or on requisition and is used in day-to-day maintenance. Slow-moving repair parts are not stocked in the combat area but farther to the rear.

- (2) The division maintenance battalion obtains (or provides requisitioning facilities for), stores, and issues repair parts and maintenance supplies authorized and required by armor units for the performance of organizational maintenance. Except for those items provided by the transportation aircraft maintenance company, the main support company serves as a base of supply for repair parts and maintenance supplies. It obtains and distributes repair parts and maintenance supplies required by the forward support companies and issues repair parts and maintenance supplies to divisional units. Each forward support company keeps a stock of supplies to support its maintenance activities and carries a stock of fast-moving repair parts and maintenance supplies for issues to supported unit. The transportation aircraft maintenance company keeps a stock of transportation air items that are required and used primarily in support of its own maintenance operations. Repair parts and supplies from the transportation aircraft maintenance stocks are issued to supported units only in emergencies and only when authorized to be used at organizational level.

c. Requests and Requisitions. Repair parts and other maintenance supplies are issued on the basis of requests or by direct exchange. Separate company maintenance sections and battalion/squadron maintenance platoons request repair parts whenever a stocked part that

is not on the direct exchange list is expended, or when the authorized nonstocked part is needed for a current repair job.

- (1) Repair parts are provided in several ways—certain fast-moving items as well as direct exchange items may be provided by work parties/contact teams from the forward support companies during the course of their visits to supported units. No formal paperwork is required for this transaction, but items issued should be shown on the unit stock record cards so that demand data is recorded accurately.
- (2) Direct exchange items may be obtained from the direct exchange section of the forward support company or main support company. The supported maintenance elements are required to take the unserviceable item, properly tagged in exchange for a like serviceable item.
- (3) Direct exchange for air items is provided by the transportation aircraft maintenance company.
- (4) For routine replenishment supply of organizational repair parts and maintenance supplies, supported units prepare requisitions and submit them to the supporting forward support company or transportation aircraft maintenance company, as appropriate.

d. Distribution. Repair parts may be picked up by the requesting unit at the supporting maintenance activity or delivered to the requesting unit by the maintenance battalion.

Section IX. MAINTENANCE

157. Maintenance Responsibility

Maintenance is a command responsibility. The commander is responsible for the proper maintenance of all equipment under his control. When the requirements for maintenance exceed a unit's capabilities, the commander must insure that the next higher echelon of maintenance is notified promptly.

158. Organizational Maintenance

a. Organizational maintenance is authorized to be performed by, and the responsibility of, a unit on its own equipment. Organizational maintenance incorporates first and second echelons as follows:

- (1) *First echelon.* First-echelon maintenance is performed by the user,

wearer, operator, or crew of the equipment. It consists of inspecting, cleaning, servicing, lubricating, repairing, testing, and replacing parts as prescribed by applicable technical publications and parts lists.

- (2) *Second echelon.* Second-echelon maintenance includes all elements of organizational maintenance not prescribed as first-echelon, such as scheduled preventive maintenance, minor adjustment, repair, tests, technical assistance, supervision, and inspections. Second-echelon maintenance is performed by specially trained personnel in the using organization. Appropriate publications authorize tools, repair parts, supplies, test equipment, and personnel to perform work beyond the capabilities and facilities of the first echelon. First-echelon personnel normally participate in second-echelon maintenance by performing tasks within their capability.

b. Each company/troop of an armor unit has a second-echelon maintenance capability. The company/troop maintenance section is manned and equipped to perform maintenance and evacuation. Maintenance and evacuation that are beyond the capability of the company/troop are reported to the supporting maintenance elements.

c. The battalion/squadron contains a maintenance platoon that is responsible for backup second-echelon maintenance performed in the company/troop. It is manned and equipped to provide recovery, maintenance, and evacuation support to the companies/troops. The maintenance platoon is provided specialists and tools to perform maintenance over and above that of company/troop maintenance sections. Maintenance and evacuation that are beyond the scope or capability of the maintenance platoon are reported up to the supporting maintenance elements.

159. Field Maintenance

Field maintenance is maintenance performed by designated maintenance units in direct support of other units. It incorporates third and fourth echelons of maintenance.

a. Third-echelon maintenance is authorized by technical applications to be performed by specially trained units in direct support of using organizations. Third-echelon is authorized a larger assortment of repair parts and subassemblies, and more precise tools and test equipment, than are authorized for lower echelons. Third-echelon units repair assemblies and subassemblies, and repair the overflow from the lower echelons within limits of authorized skills, tools, equipment, and repair parts. They provide technical advice, mobile repair crews, and repair parts supply to the lower echelons.

b. Third-echelon maintenance is provided to divisional armor units by the division maintenance battalion for all items, except cryptographic and medical items. Employment of the maintenance battalion is described in FM 9-30. Maintenance support for cryptographic and medical equipment is provided by the division signal and medical battalions.

c. Fourth-echelon maintenance is maintenance performed by units organized as semi-fixed or permanent shops to serve lower-echelon maintenance, usually for return of repaired items to supply channels. Although armor equipment goes to fourth-echelon maintenance shops, armor units do not normally deal directly with fourth-echelon units.

160. Recovery and Evacuation of Vehicles

a. Commanders at all echelons are responsible for the prompt recovery and evacuation of damaged vehicles and their return to service. When combat units are unable to recover disabled vehicles, direct support maintenance units are requested to assist in recovery operations.

b. Axes of supply and evacuation and the location of maintenance collecting points are designated before an operation. Company/troop maintenance sections and battalion/squadron maintenance platoons recover disabled vehicles from the battlefield and move them to the axis of supply and evacuation or to maintenance collecting points designated by the next higher echelon of maintenance. Division maintenance units assume responsibility at these locations and repair and return the vehicles to service. If the direct support unit

cannot repair a vehicle immediately, a replacement vehicle may be issued from a maintenance float.

c. Battlefield recovery is accomplished by company/troop recovery vehicles, augmented if necessary by recovery vehicles from the battalion/squadron maintenance platoon. Company/troop recovery vehicles follow in close support of the unit; disabled vehicles are towed into defiladed positions and repaired if possible. In a fast-moving offense, if company/troop maintenance personnel cannot repair a vehicle, they tow it to the battalion/squadron axis of supply and evacuation and report its location and condition to the battalion/squadron main-

tenance platoon. In a slow-moving offense or defensive operation, if company/troop maintenance personnel cannot repair a vehicle, they tow it to the battalion/squadron maintenance collecting point (figs. 9 and 10).

d. The battalion/squadron maintenance platoon finding disabled vehicles along the axis of supply and evacuation or receiving disabled vehicles at the battalion/squadron maintenance collecting points repair them if they can and if the time is available. Repaired vehicles rejoin their units as soon as practicable. Vehicles beyond the immediate repair capability of the maintenance platoon are evacuated by the platoon to the maintenance collecting point estab-

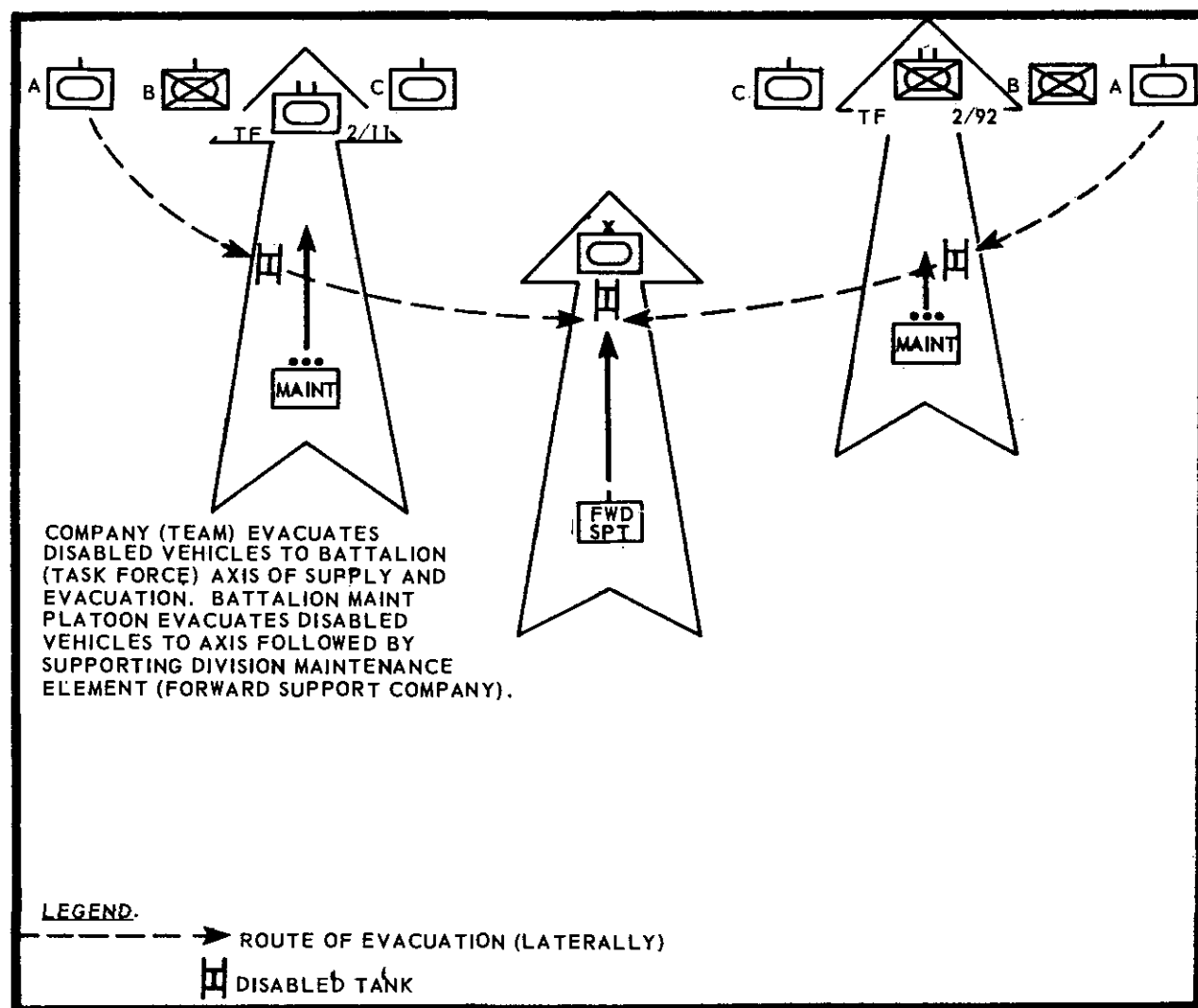


Figure 9. Evacuation of disabled vehicles in the fast-moving situation.

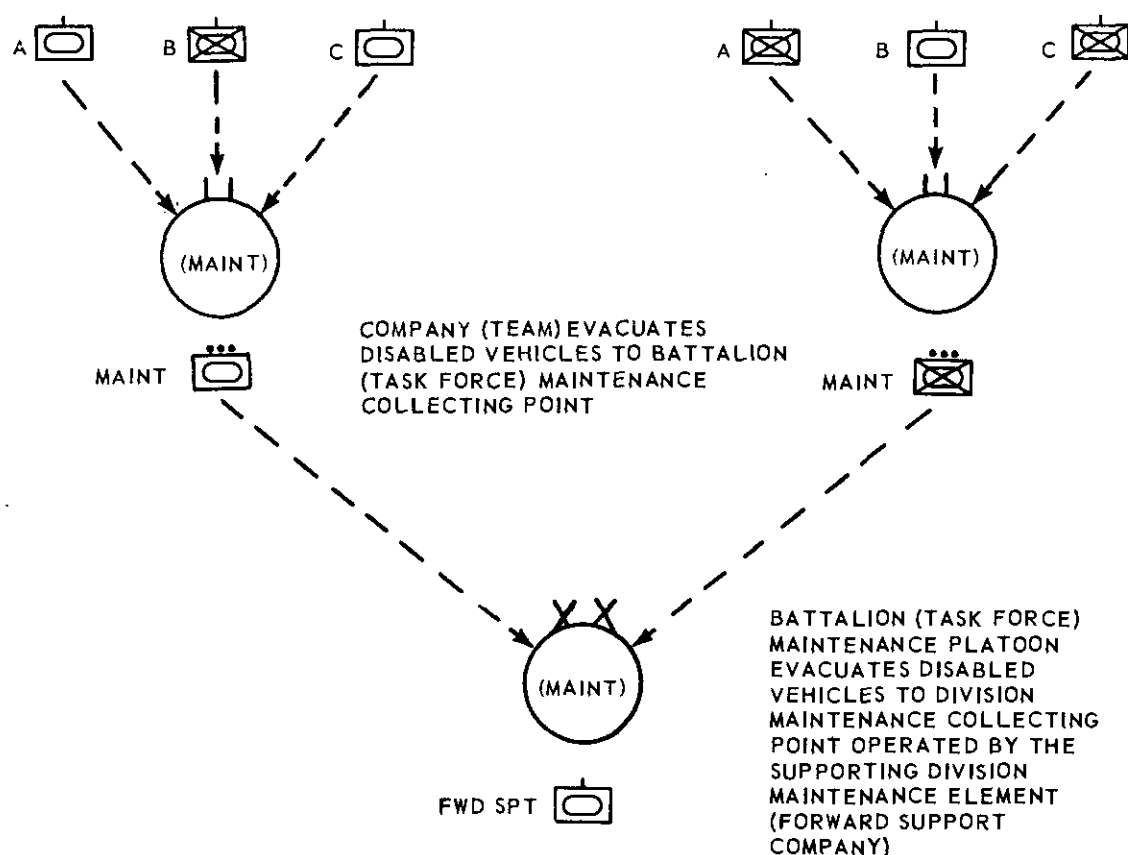


Figure 10. Evacuation of disabled vehicles in the defense or slow-moving offense.

lished by the supporting forward support company. In a fast-moving situation, it may not be practicable to evacuate to the established maintenance collecting point, in which case the battalion/squadron maintenance platoon evacuates disabled vehicles to the brigade axis of supply and evacuation.

e. Maintenance personnel who are fired on when performing battlefield recovery employ their individual and vehicular weapons to the maximum, while combat units in the vicinity cover them with supporting fire to permit recovery. Vehicles that cannot be recovered because of combat conditions, and whose capture is imminent, are destroyed in accordance with existing instructions.

f. During fast-moving offensive operations,

vehicles that obviously cannot be repaired are not recovered by combat and direct support units. However, their exact location and condition are reported through maintenance channels. Recovery and evacuation of such vehicles are a responsibility of army.

g. In the division, the vehicle driver and at least one other crewman will accompany a tracked vehicle through the echelons of maintenance, and assist in its repair. The repaired vehicle or a replacement vehicle will be returned by the evacuation crew. If it is necessary for the vehicle to be evacuated beyond division for repair, the evacuation crew returns to the parent units. The evacuation crew for a wheeled vehicle will normally consist of the driver.

161. Recovery and Evacuation of Air Vehicles

a. Whenever possible unflyable air vehicles are repaired in place, if only to the extent that they can be cleared for a one-time flight to more suitable repair facilities. The structural characteristics of an air vehicle do not adapt it to extensive movement by ground transportation. Normally, the dismantling and special rigging required for evacuation of an air vehicle requires more personnel and time than if the air vehicle were repaired and flown out. However, the extent of required repairs, or the air vehicle site, may leave no alternative to evacuation.

b. Armor units having organic air vehicles are not responsible for their recovery or evacuation, other than to assist as appropriate in consideration of personnel, equipment, and time available. However, the armor unit is responsible for requesting assistance from the supporting direct support maintenance unit. If recovery operations are required, it will be indicated in the initial request for assistance. The request will include location, type and identification of air vehicle, identification of individual and unit making the request, parent unit of the air vehicle, and description of damage.

162. Recovery, Repair, and Evacuation of Signal Equipment

a. Companies/troops recover and repair signal equipment within their capabilities. Signal equipment requiring repair beyond the capability of company/troop is evacuated as follows:

- (1) Equipment installed in disabled vehicles is evacuated with the vehicle in accordance with procedures in paragraph 160.
- (2) Separate items may be evacuated directly to the battalion/squadron communication platoon or to the battalion/squadron maintenance collecting point. Companies/troops normally use available battalion/squadron transportation moving to the rear, to evacuate equipment.

b. The battalion/squadron communication platoon repairs signal equipment within its

capability and returns it to the company/troop. The communication platoon works closely with the maintenance platoon to repair signal equipment in vehicles undergoing maintenance. Cryptographic equipment should be evacuated directly to the division signal battalion.

163. Recovery and Evacuation of Medical Equipment

Combat units normally recover or evacuate medical equipment requiring maintenance above the first echelon through medical channels. However, the division, medical equipment may be evacuated to maintenance collecting points established by the supporting forward support company.

164. Recovery, Repair, or Evacuation Under Nuclear Conditions

a. In nuclear warfare, maintenance elements will have two main factors to contend with that are not present in conventional warfare: contamination of the maintenance area by nuclear fallout; and the handling of contaminated equipment. Whenever radioactivity is suspected, maintenance personnel use radiacmeter to determine the levels of intensity so that protective and decontamination measures may be taken.

b. If radioactivity in the maintenance area exceeds the dose rate specified by the unit commander, the maintenance element should move to an area of less intensity. Maintenance personnel monitor radiation levels en route to equipment requiring recovery so that heavily contaminated areas may be avoided. If the equipment is located in an area that exceeds the specified dose rate, recovery should be delayed until the radioactivity has decayed to a safe level.

c. Contaminated equipment should be decontaminated before it is repaired. Decontamination procedures are discussed in paragraphs 170 through 180.

d. The techniques of evacuation and the procedure of establishing an axis of supply and evacuation or points for collection of disabled equipment are essentially the same as under nonnuclear conditions.

Section X. MEDICAL SERVICE

165. General

Commanders at all levels are responsible for providing proper medical service to the members of their commands. The objectives of such medical service are the conservation of trained manpower and the preservation of unit efficiency and morale. These objectives are attained by strict adherence to the principles and procedures of preventive medicine, sanitation, treatment, and by rapid evacuation of those in need of evacuation. Medical service, to be effective, must be planned and conducted to conform to and support the tactical plan.

166. Unit Medical Service

a. Unit medical service includes battlefield acquisition of the wounded, injured, or sick; emergency medical treatment by company/troop aidmen; evacuation to the unit and station, and further emergency or definitive treatment at the aid station as required. Unit medical service includes advising the commander on military field sanitation, disease prevention, and the health of the command.

b. Unit medical service is provided to armor units by organic medical sections.

167. Division Medical Service

Division medical service is provided by the division medical battalion and includes the evacuation of patients from the battalion/squadron aid stations, the operation of division clearing stations, and the furnishing of medical supply and emergency dental service. Division medical service is discussed in FM 8-10 and FM 8-15.

168. Medical Treatment and Evacuation

a. Each battalion/squadron medical section establishes one or more medical aid stations and provides a medical aid-evacuation team for each organic company/troop. The medical aid-evacuation teams move with company/troop combat trains following closely behind the combat elements. Casualties occurring in the company are given first-aid or emergency medical treatment by the medical aid-evacuation team. If further treatment is required, casualties are

evacuated to the battalion/squadron aid station by the medical aid-evacuation team.

b. At the aid station, casualties are sorted as to type and degree of injury or illness. Personnel requiring treatment are returned to duty as rapidly as possible. If the tactical situation permits, casualties who will be able to return to duty in a short time are retained in or near the aid station and are returned to duty from there. Casualties who must be evacuated for further medical treatment are prepared for evacuation.

c. The supporting medical unit is responsible for evacuation from battalion/squadron aid stations. In the division, field ambulances from the medical company supporting each brigade evacuate casualties from the battalion aid stations to the division clearing station located in the brigade trains area. Division ambulances evacuate casualties from the battalion/squadron aid station to the nearest division clearing station.

169. Medical Support of the Air Cavalry Troop

a. The air cavalry troop receives medical support from the squadron medical section as described for the troop in paragraph 168. However, during operations involving extensive use of the organic air-ground elements, one aidman may be provided for each tactical grouping (i.e., one per platoon, or platoon team) commensurate with the availability of medical personnel.

b. When the air cavalry troop is conducting operations in conjunction with ground combat units, casualties requiring medical treatment beyond the capability of the troop aidman will normally be turned over to the ground unit for evacuation by air or ground means, as appropriate.

c. When the air cavalry troop is operating in enemy controlled territory, normal evacuation means will be by air. Air ambulances of the field army medical service provide evacuation support on an on-call basis. If the army unit cannot provide the required support, air vehicles from the divisional aviation battalion or

the air cavalry troop may be used to evacuate casualties requiring immediate medical or surgical treatment to the nearest medical facility. Casualties not requiring immediate medical at-

tention will be evacuated when the troop or troop elements withdraw to friendly territory. In all cases, the tactical mission is given priority on the use of organic air vehicles.

Section XI. AREA DAMAGE CONTROL

170. Purpose

Definite measures must be taken to minimize the effects of a mass destruction attack caused by enemy means or by natural disaster. The measures considered in this section, when appropriately modified, are applicable to the squadrons of the armored cavalry regiment as well as units of the division.

171. General

a. In the division, rear area damage control is directed primarily toward minimizing the impairment of division combat service support and aiding in reestablishing such support (FM 61-100 and FM 54-2). Area damage control planning is a function of the logistics officer.

b. In forward areas, area damage control is directed toward minimizing interference with tactical operations and minimizing the loss of combat power.

c. Area damage control activities are a command responsibility, and the commander at each echelon is responsible for damage control training and effective implementation of damage control plans. The commander must direct all measures and means at his disposal toward accomplishing the tactical mission, and at the same time minimizing the possibility of losses of personnel and materiel to an enemy mass destruction attack.

172. Area Damage Control Measures Before an Operation

a. Damage control organizations and procedures must be established in workable damage control SOP's.

b. Units and individuals must be trained thoroughly in passive protective measures against an enemy nuclear attack. These measures are discussed in appendix XXIV.

c. Area damage control training in conformance with established SOP's must be integrated with all phases of tactical training.

d. During the planning of an operation, the commander and his staff must provide for area damage control measures that can be taken if the unit or its elements are subjected to an enemy mass destruction attack or a natural disaster.

173. Area Damage Control Measures Taken During an Operation

a. The massing of troops and units should be avoided except when essential to accomplishing the mission and then only for a minimum period.

b. Adequate dispersion between units and in units is maintained.

c. When units are on the move, every effort is exerted to keep them moving. Fleeting targets are relatively poor nuclear targets.

d. When units are not on the move, individual vehicle movement is minimized. Essential movement is restricted to periods of poor visibility preferably during hours of darkness.

e. Units do not remain stationary for prolonged periods.

f. Effective use of air and ground reconnaissance means is practiced.

g. Maximum use is made of cover and concealment.

h. The commander and his staff continually review their dispositions and actions to be taken if the unit is subjected to a mass destruction attack.

174. Area Damage Control Measures Taken After an Enemy Mass Destruction Attack

a. The Affected Unit.

- (1) Individuals and units immediately adopt protective measures, such as taking the best available cover, and don protective clothing and equipment

to minimize the residual effects of the weapon.

- (2) All operative communication facilities report expeditiously the situation and condition of the affected unit to the next higher effective headquarters.

b. Units Observing the Mass Destruction Attack.

- (1) Every effort is directed toward continuance of the assigned mission. A report of the observation of the attack should be submitted to the next higher effective headquarters.
- (2) Commanders of units unaffected by the attack should anticipate a possible change in mission to counter the attack's effects on the plan of the next higher headquarters. This reduces reaction time when a change of mission is received.

c. Next Higher Headquarters of Unit Subjected to a Mass Destruction Attack.

- (1) Receives reports from subordinate units concerning the enemy attack; determines the extent of damage as early as possible, and issues necessary orders to continue the assigned mission.
- (2) As early as feasible, acts to restore the effectiveness of the unit subjected to the attack. If necessary, an area damage control organization will be employed in the affected area. Appropriate functions for the organization performing area damage control operations are—
 - (a) Determine and report the effectiveness of elements of the unit subjected to the attack.
 - (b) Assume control of disorganized personnel and elements of the affected unit.
 - (c) Restore communication in the affected unit and from the affected unit to its next higher headquarters.
 - (c) Release effective elements to the control of the next higher headquarters.
 - (e) Evacuate casualties to appropriate medical installations.

- (f) Evacuate vehicles and major items of equipment to appropriate vehicle and equipment collecting points.
- (g) Perform decontamination.

175. Decontamination Measures

a. Radiological Decontamination. Radiological decontamination measures are unit and individual measures taken to reduce the dose rate resulting from fallout. They include—

- (1) Brushing or sweeping off clothing and equipment. If possible, a complete change of clothing should be issued and the old laundered.
- (2) Bathing as soon as possible.
- (3) Turning over the soil in the immediate area of foxholes, vehicles, and occupied installations. This buries the fine fallout particles and reduces intensity.
- (4) Hosing or washing equipment and vehicles with soap or other detergents at the earliest opportunity.

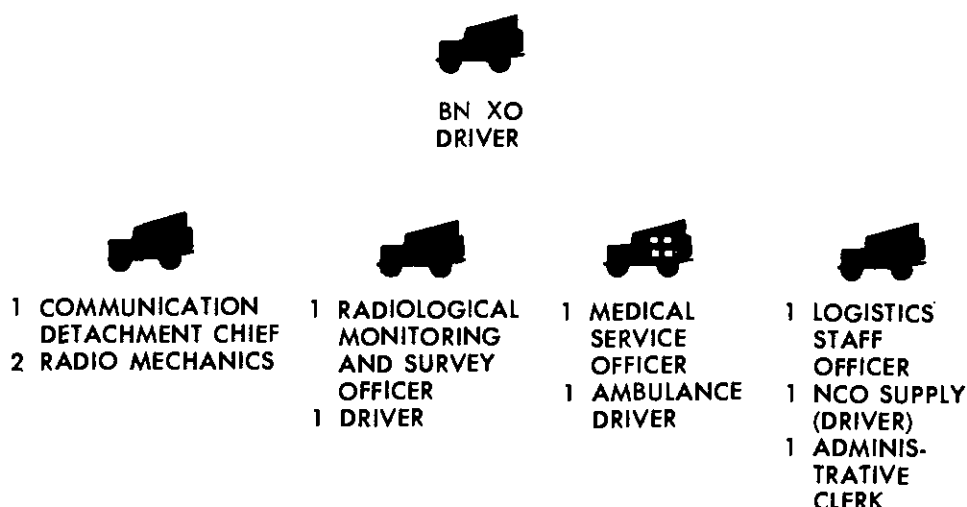
b. Decontamination of Vehicles after Toxic Attack. A contaminated armored vehicle will continue its mission until the tactical situation permits decontamination by the crew. For very light contamination, exposure to the weather may be sufficient for decontamination. Decontamination of the interior of the vehicle may be accomplished by the use of forced hot air or wiping with rags. Other expedients are protective ointment (on small critical areas) and solvents such as kerosene, fuel oil, and diesel oil; when such expedients are used, they must be washed off or otherwise removed before damage occurs to sensitive materiel. To decontaminate the outside of a vehicle, the crews will spray the vehicle with decontaminating apparatus. Should this prove insufficient, specially trained personnel may scrub the entire vehicle with hot soapy water or apply the bleach slurry or DANC method. Decontamination is performed at decontamination points in maintenance areas by vehicle crews and special units. For additional information on decontamination and further explanation of the above methods, see TM 3-220 and FM 21-40.

176. Provisional Area Damage Control Teams

a. General. Units subjected to a mass destruction attack or natural disaster use all means necessary to reestablish unit effectiveness as rapidly as possible. In circumstances where assistance is required from sources outside the unit, other units may be directed to assist. Armored cavalry units are highly qualified for conducting area damage control operations. Where it is not feasible to employ TOE units, provisional area damage control units

can be organized and employed. Provisional damage control teams are established usually by unit SOP. These teams must be capable of taking decisive and coordinated action in area damage control operations when TOE units cannot be employed.

b. Control and Assessment Team (CAT). Each battalion/squadron headquarters establishes a control and assessment team. A type battalion control and assessment team with personnel, major items of equipment, and a statement of functions is shown in figure 11.



FUNCTIONS

MOVES TO DAMAGE AREA ON ORDER, WITHOUT DELAY

ESTABLISHES A CONTROL AND ASSESSMENT TEAM COMMAND POST

DETERMINES AND REPORTS EFFECTIVENESS OF UNITS

ASSUMES CONTROL OF UNITS IN AFFECTED AREA

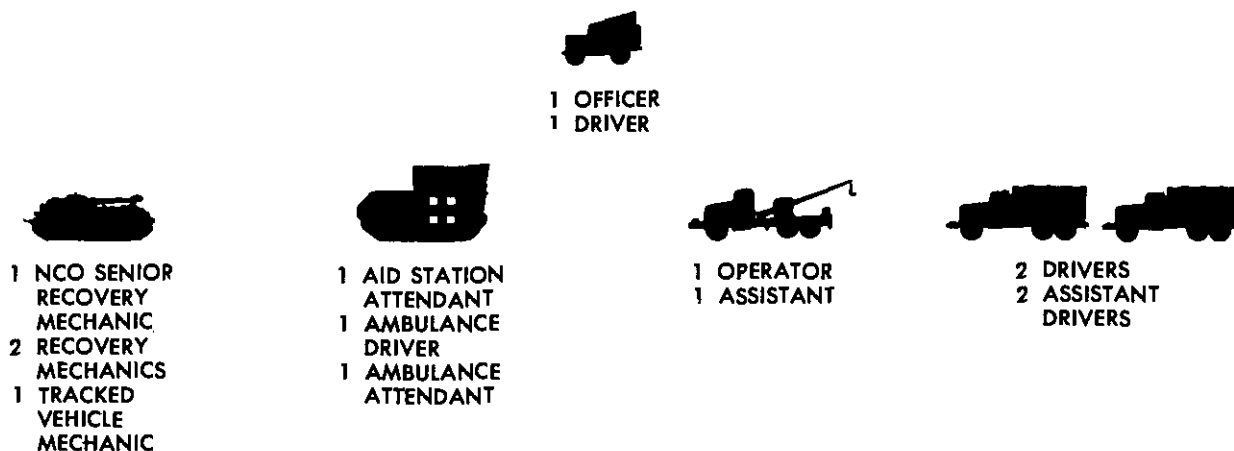
RESTORES COMMAND AND COMMUNICATION TO AFFECTED UNITS

RELEASES COMBAT EFFECTIVE UNITS TO TACTICAL COMMANDER

REQUESTS REQUIRED TECHNICAL SERVICE SUPPORT

DIRECTS AND CONTROLS THE OPERATION OF RESCUE SQUADS

Figure 11. Type combat battalion control and assessment team.



FUNCTIONS

OPERATES CASUALTY AND EQUIPMENT COLLECTING POINTS

PROVIDES LIMITED EMERGENCY MEDICAL TREATMENT

CONDUCTS RADIOLOGICAL MONITORING

PROVIDES ASSISTANCE TO COMPANY RESCUE SQUADS

Figure 12. Type combat maneuver battalion rescue squad.

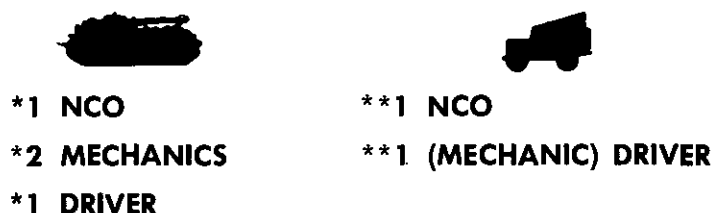
c. Battalion/Squadron Rescue Squad. Each battalion/squadron headquarters establishes a battalion/squadron rescue squad. This squad will be assembled on order and attached to a control and assessment team for area damage control operations. A type battalion rescue squad with personnel, major items of equipment, and statement of functions is shown in figure 12.

d. Company/Troop Rescue Squad. Each combat company-size unit establishes a company/troop rescue squad, which will be assembled on order and attached to a control and assessment team for area damage control operations. A type company rescue squad with personnel, major items of equipment, and statement of functions is shown in figure 13. Other organizations as desired by the commander can be established by SOP in conformance with his organizational structure and concept of performing area damage control operations.

177. Employment of Provisional Area Damage Control Units

a. Provisional area damage control units, established by SOP, are employed on a particular area damage control mission when it is not practical to employ TOE units. When it is necessary to employ provisional area damage control units the next higher headquarters of the affected unit will designate the provisional area damage control units in the command to perform the area damage control mission. For example, if a company-size unit has been subjected to a mass destruction attack, and requires assistance, the battalion will determine what provisional area damage control teams will be employed for the area control mission. If the area damage control operation requires means in excess of those of the parent organization, additional means may be requested from the next higher headquarters.

b. The next higher headquarters of the affected unit may initiate area damage control



FUNCTIONS

ADMINISTERS FIRST AID

RESCUES AND REMOVES CASUALTIES

EVACUATES VEHICLES AND MAJOR ITEMS OF EQUIPMENT

CONDUCTS RADIOLOGICAL MONITORING

PERFORMS LIMITED HASTY DECONTAMINATION

*** PERSONNEL AND RECOVERY VEHICLE PROVIDED BY MAINTENANCE SECTION**

**** PERSONNEL AND ¼-TON TRUCK PROVIDED BY CO HQ**

Figure 13. Type company rescue squad.

operations in the affected area using its SOP-established control and assessment team to direct the operation. In battalion-level area damage control operations, the battalion rescue squad and the unaffected company rescue squads can be employed under the direction of the battalion control and assessment team to direct the operation. In battalion-level area damage control operations, the battalion rescue squad and the unaffected company rescue squads can be employed under the direction of the battalion control and assessment team.

c. Because the employment of provisional area damage control units reduces the parent unit's capability for sustained combat, it is imperative that provisional units rejoin the parent unit as soon as possible. Control of the affected unit and area should pass to follow or support units as soon as practical. In the absence of relief, provisional area damage control units will terminate area damage operations when accomplishment of the parent unit's mission is dependent on the personnel and equipment involved in the area damage control mis-

sion or when further efforts by the control and assessment team and rescue squads are no longer practical.

178. Conduct of Operation

a. *General.* A method of conducting battalion-level area damage control operations after an enemy nuclear attack, using a provisional area damage control organization, is described in the following illustrative example:

- (1) Task force 2/11 Armor has been advancing on two axes (fig. 14). Team B was struck by an enemy nuclear airburst weapon. In the absence of assistance from sources outside the task force, the task force commander ordered Team A to bypass the affected area and to assume the mission of Team B. Other units continued their assigned missions.
- (2) Concurrently, the task force commander committed the task force control and assessment team (CAT), battalion rescue squad, and company

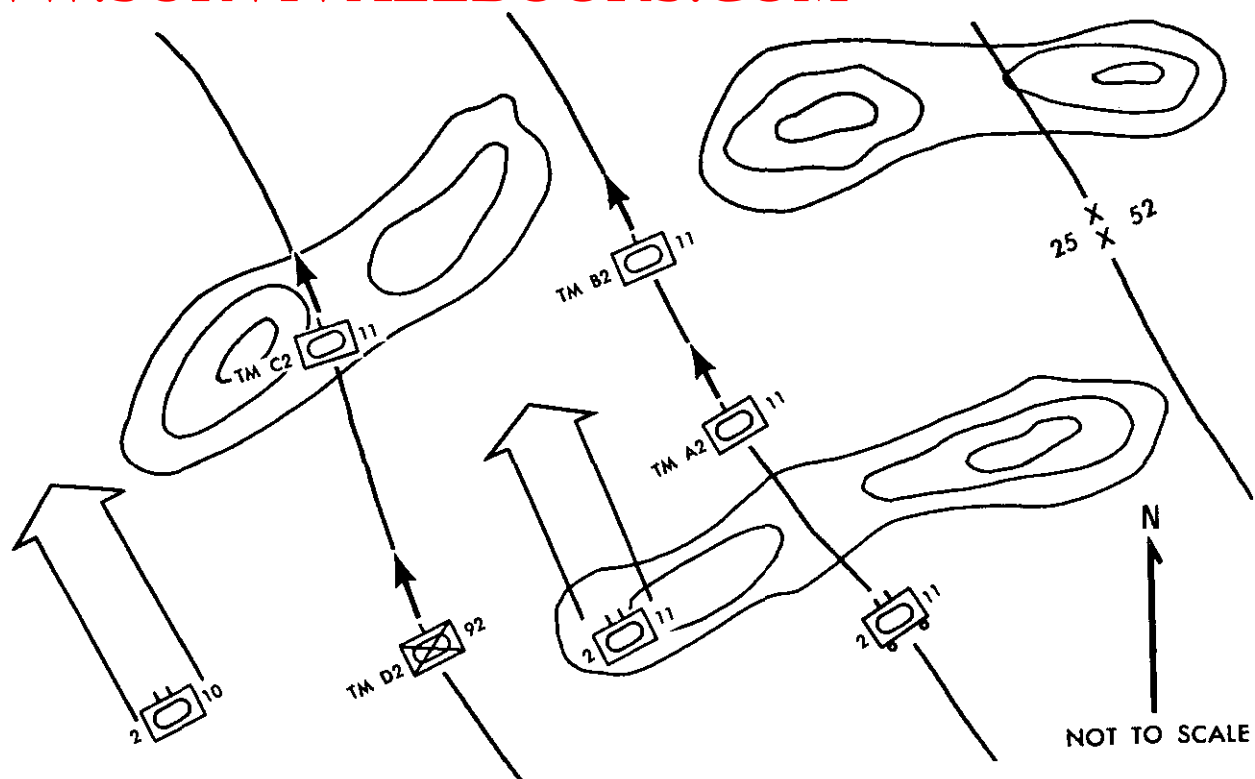


Figure 14. Task force situation before enemy nuclear attack.

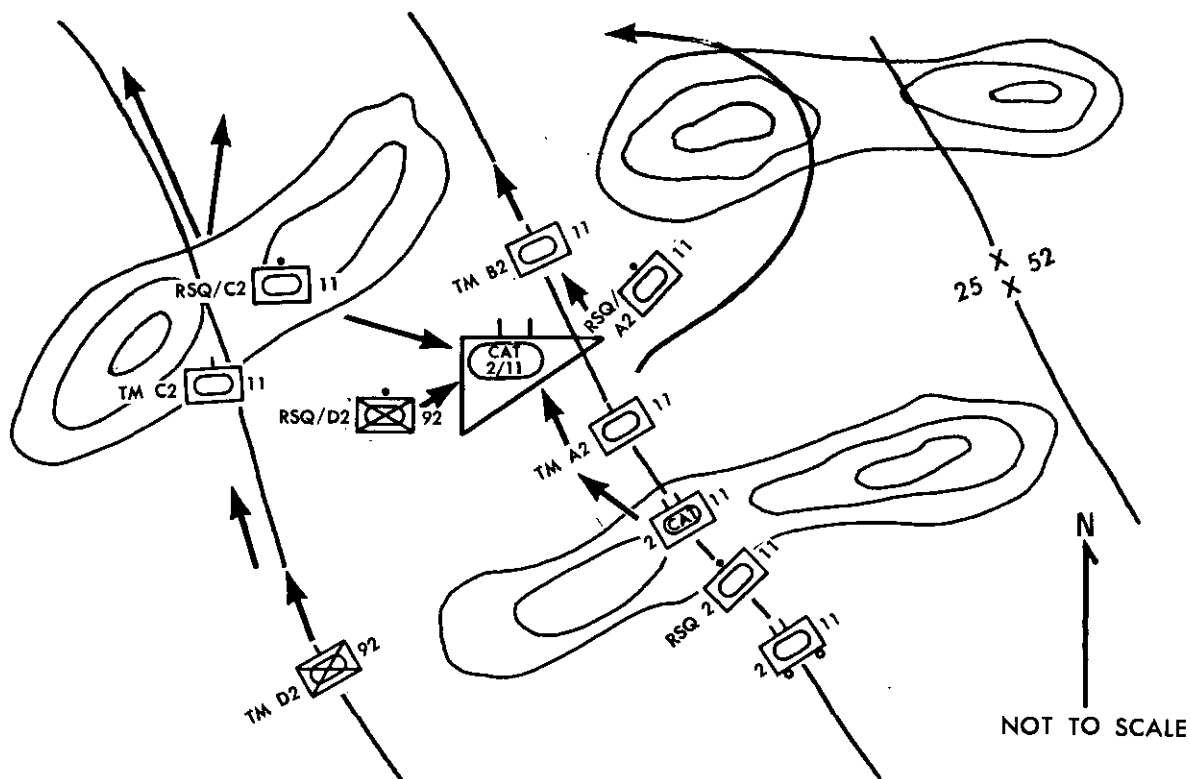


Figure 15. Provisional area damage control elements committed to render assistance to Team B.

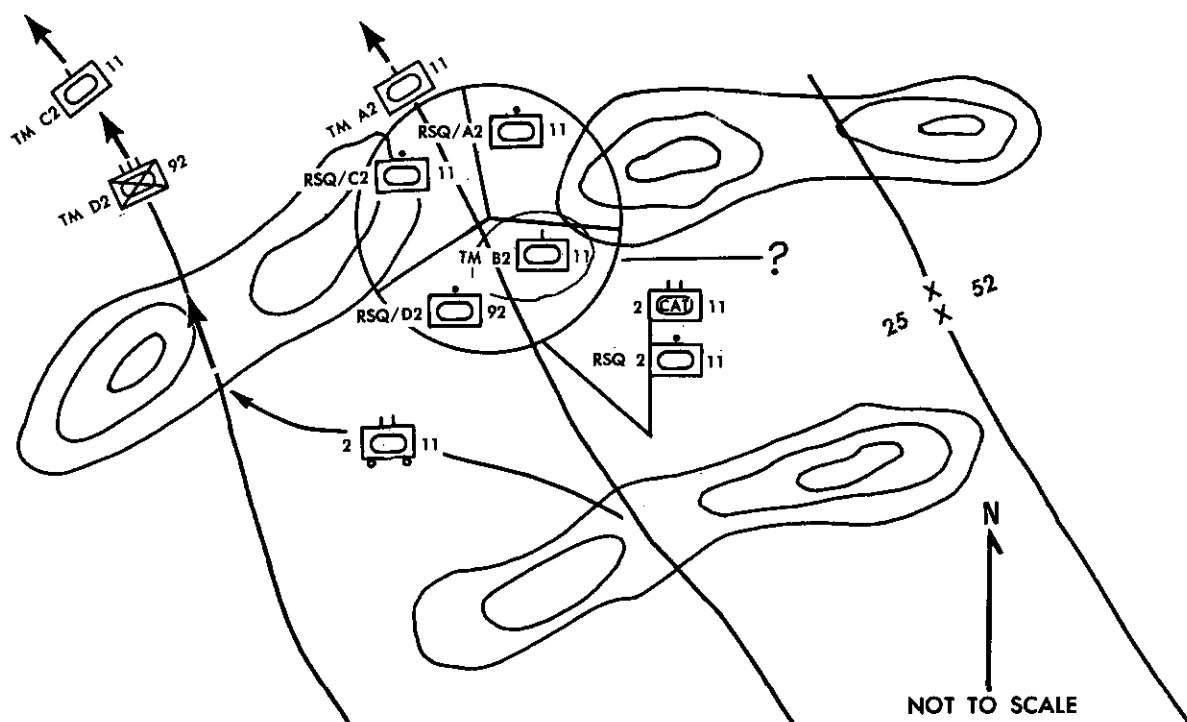


Figure 16. Task force continuation of tactical mission and damage control areas of responsibility.

rescue squads of the unaffected teams to conduct area damage control operations in the affected area (fig. 15). The initial estimate of effects indicated that the weapon was a 50-KT low airburst. The area in the damage radius of concern was assigned to the task force CAT, which in turn assigned sectors to the company rescue squads (fig. 16). The radius of the area of concern should be determined by direct damage assessment. However, a hasty radius to be used in initial planning can be determined by using the negligible risk, unwarned, exposed safety radius for the estimated yield contained in FM 101-31. This radius can be adjusted when area damage control elements arrive and the actual extent of damage is determined.

b. Control and Assessment Team. The control and assessment team (CAT) commander or his representative should make an air survey of the area assigned to estimate the extent and

nature of damage. CAT communication nets are opened and attempts are made to establish communication with the affected unit. The CAT establishes a command post, where area damage control operations in the affected area are directed, controlled, and supervised.

c. Battalion Rescue Squad. The battalion rescue squad operating in the vicinity of the CAT command post establishes and operates an equipment collecting point and a casualty collecting point and provides general support to the company rescue squads.

d. Company Rescue Squads. Company rescue squads proceed to their assigned sectors of responsibility, conducting radiological monitoring while proceeding to and through the affected area. Once in the immediate area of the affected units, the company rescue squads perform the following tasks:

- (1) Establish control over the survivors and direct supervisors to perform tasks within their capabilities.
- (2) Administer essential first aid: sort casualties based on urgency and con-

dition; and evacuate personnel casualties to the battalion rescue squad personnel casualty collecting point.

- (3) Evacuate operable vehicles and vehicles requiring minor repairs to the battalion rescue squad equipment collecting point.
- (4) Evacuate other materiel in priority of criticality.
- (5) Perform necessary hasty decontamination of equipment at the earliest opportunity after clearing the affected area.
- (6) Report contamination readings as specified in the SOP.

e. Reorganization. At designated rallying points and collecting points of the battalion rescue squad, personnel and materiel are reorganized as necessary to constitute elements capable of further combat. When possible, maximum use is made of surviving commanders of affected units to effect reorganization.

In the absence of surviving commanders capable of reorganizing the units, the CAT commander will take charge of the reorganization.

179. Brigade Level Operations

When a battalion of a brigade is subjected to a mass destruction attack, the brigade may perform area damage control operations in the affected area by employing the brigade CAT and the provisional area damage control team of the unaffected attached units. Conducting a brigade level operation, with provisional area damage control units, generally parallels the method of battalion-level operations.

180. Natural Disasters

Although not specifically described herein, measures taken and the procedures and employment of area damage control provisional organizations are the same for natural disasters (e.g., floods, typhoons, etc.) as for nuclear attack.

CHAPTER 7

THE OFFENSE

Section I. GENERAL

181. Doctrine of the Offense

Armor units employ firepower and maneuver in the attack to dominate, neutralize, or destroy enemy forces; to control terrain; or to disrupt enemy rear areas. Armor plans boldly and

thoroughly and attacks aggressively and violently to gain maximum shock effect in destroying the enemy, including his materiel and will to resist. This violence contributes to success by weakening the enemy to the point where he can no longer resist effectively

Section II. CONSIDERATIONS OF THE OFFENSE

182. Fundamentals of Offensive Action

a. Armor units participate in offensive operations by attacking with fire and maneuver.

b. Fire and maneuver are accomplished by a base of fire and a maneuver force.

(1) *Base of fire.*

(a) *Mission.* The base of fire pins the enemy to the ground and neutralizes his weapons, thereby permitting freedom of action by the maneuver force. The base of fire normally does not close on the objective.

(b) *Composition.* In an armor unit, the base of fire consists of organic mortars and supporting artillery, including rockets and missiles, tactical air if available, and, in certain situations, naval gunfire. Tanks are assault weapons and should be used to assist the base of fire only when they are unable to participate in the maneuver force because of non-trafficable terrain or obstacles that they cannot negotiate immediately.

(c) *Employment.*

1. The base of fire should be assigned specific targets and target areas on which to fire during the advance of the maneuver force, during the assault, and during continuation of

the attack or the consolidation of the objective. Signals for lifting or shifting these fires must be prearranged and should include visual signals. The base of fire must be prepared to deliver fires on targets of opportunity.

2. The base of fire is located in a position or is prepared to move to positions from which it can continuously deliver fire to support the maneuver force. Alternate positions are selected for all weapons.

(2) *The maneuver force.*

(a) *Mission.* The maneuver force closes with and destroys the enemy.

(b) *Composition.* The maximum possible strength should be placed in the maneuver force. When possible, it should be a combined arms force of tanks and mechanized infantry.

(c) *Employment.* The maneuver force closes with the enemy as quickly and directly as possible to exploit the effects of the base of fire. Usually it is committed so that it has mass and depth, and when possible, it seeks to attack one or both flanks of the enemy. Once the maneuver force is committed, it should proceed with all the speed and violence

at its command. The advance should be timed so that the elements of the maneuver force arrive on the objective simultaneously, so that the tanks and mechanized infantry can provide mutual support. As the objective is reached and overrun, the base of fire is shifted to the flanks and rear of the objective and the assault fires of all weapons of the maneuver force are intensified.

c. The attack is planned thoroughly and executed violently. The commander must take maximum advantage of the inherent characteristics of his combined arms force to insure a concentration of superior combat power at the proper time and place. Planning should

take advantage of terrain and be sufficiently flexible to permit enemy weaknesses to be exploited rapidly. For a detailed discussion on planning and conduct of the attack, see paragraphs 184 through 195.

183. Factors Affecting the Planning and Conduct of the Offense

Throughout the planning and conduct of offensive operations, commanders and staff officers must consider the factors of METT. Regardless of the situation or level of command, these factors are considered continuously and simultaneously to insure maximum use of all available combat power. For a detailed discussion, see paragraphs 29 through 33.

Section III. PLANNING FOR THE ATTACK

184. General

In planning the attack, the commander and his subordinates (including his staff) follow the procedures described in chapters 3 and 4 as regards estimates, troop leading procedures, orders, and supervision. In offensive operations, the plan normally includes those factors discussed in paragraphs 43 through 47.

185. Plan of Attack

a. *General.* When the commander arrives at his decision, he completes his plan of attack. The plan is simply a detailed elaboration of the fifth step of the estimate—the decision. It must be simple, but cover all essential details. The plan of attack includes the scheme of maneuver and the plan of fire support.

b. *Scheme of Maneuver.* The scheme of maneuver is the detailed plan for the placement and movement of the maneuvering force into advantageous positions with respect to the enemy or the objective. In developing the scheme of maneuver, consideration is given to its possible effects on future operations. The scheme of maneuver includes—

- (1) Organization for combat.
- (2) Formations.
- (3) Control measures.
 - (a) Objectives.
 - (b) Direction of movement.

- (c) Line of departure.
- (d) Time of attack.

c. *Plan of Fire Support.* This plan must provide for the coordination of all available fires of organic, attached or supporting fire support agencies to include tactical air and naval gunfire. The plan of fire support includes—

- (1) Location of fires.
- (2) Schedule of fires.
- (3) Type of fires.
- (4) Assignment of missions and tasks to fire support units.
- (5) Priority of fires.

186. Organization for Combat

Organization for combat is the method by which a commander organizes or tailors his forces to meet the varying requirements of the battlefield (pars. 34–42). For a discussion on the employment of combat support units, see chapter 10 and appendix XIV. Armored cavalry units, organic or attached, are employed in accordance with FM 17–36 and FM 17–95.

187. Formations

a. *General.*

- (1) The initial formation for the attack, and subsequent changes to it, are based upon the factors of METT.

- (2) It is desirable to attack in depth because this formation permits greater flexibility in the employment of the attacking force, and assists in maintaining the momentum of the attack.
- (3) An attack in depth is favored—
 - (a) Against deep objectives.
 - (b) When the enemy situation is vague, and major enemy strongpoints or troop locations are not known.
 - (c) When there is a requirement for security against a counterattack.
 - (d) During periods of poor visibility when maximum control is desired.
- (4) A formation with less depth is favored—
 - (a) Against limited objectives.
 - (b) When major enemy strongpoints and troop concentrations are known.
 - (c) When the objective is strongly held by the enemy, and there is a requirement to place maximum fire upon the objective.
 - (d) When the situation requires maximum freedom of action by subordinate units.

b. Column.

- (1) The column formation (fig. 17) provides depth to the attack since units are in position to move through or around a leading unit. This capability contributes to—
 - (a) *Flexibility.* The commander using a column will normally have several courses of action open to permit him to retain the initiative, maintain momentum of the attack, and provide the response required to meet varying situations.
 - (b) *Retention of the initiative.* The commander using a column will have significant uncommitted combat power in the form of following units to introduce into the situation at a time and place of his choosing.
 - (c) *Maintaining the momentum of the attack.* The commander using a column has forces available to—
 1. Assume the mission of the leading unit should its combat power decrease.

2. Commit significant combat power to exploit success.

- (2) The column formation provides security to the flanks since units are in position to counter threats to either flank.
- (3) The column formation facilitates control of the unit.
- (4) Considerations that favor adoption of the column formation are—
 - (a) Restricted maneuver room.
 - (b) Enemy defenses that must be attacked on a narrow front.
 - (c) Enemy reserves in such strength and location that a sustained attack or a meeting engagement is anticipated.

c. Line.

- (1) The line is formed by placing two or more units abreast to lead the formation (fig. 18). The line formation provides combat power forward over a relatively wide front. This deployment contributes to—
 - (a) *Coordinated attacks and assaults.* A commander using a line formation can employ leading units so that their attacks are mutually supporting. He can converge the combat power of leading units into one, massive, coordinated assault.
 - (b) *Rapid development of the situation.* The commander using a line formation gains information from a broader front than if he were using a column. Gaps, weak points, or flanks of the enemy's dispositions are more rapidly discovered.
- (2) The line is more difficult to control than the column.
- (3) Considerations that favor the adoption of the line are—
 - (a) Adequate maneuver space.
 - (b) Shallow enemy defenses.
 - (c) A requirement for more combat power than one subordinate unit.
 - (d) A requirement for a rapid advance on a broad front.
 - (e) A requirement to develop the situation.

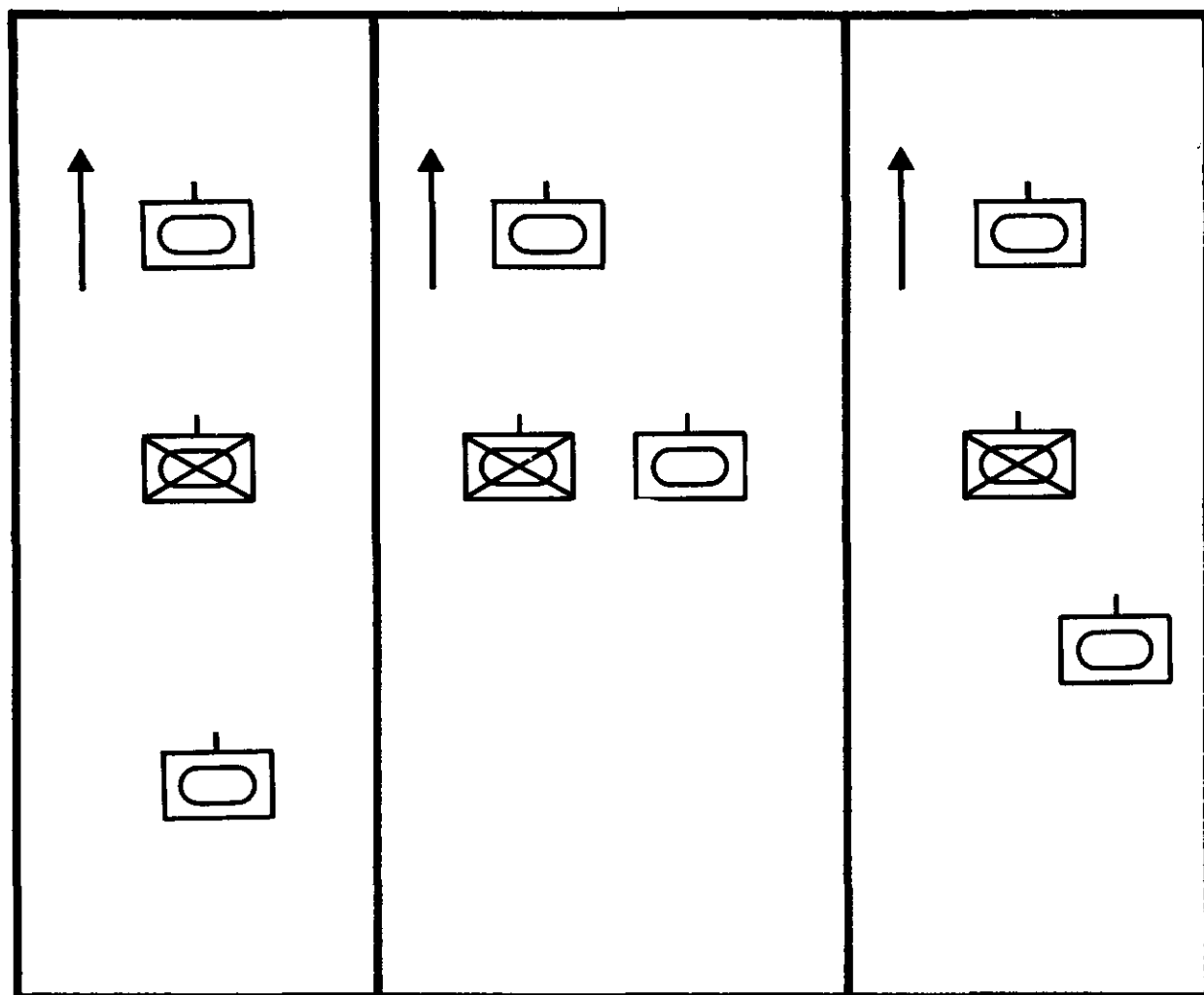


Figure 17. Variations of the column.

188. Reserves in the Offensive

a. General.

- (1) A reserve is a part of a body of troops that is kept to the rear of the formation, or withheld from action at the beginning of an engagement, and held available for a decisive movement. The reserve may consist of firepower, troops, or both.
- (2) (a) Reserves, when so designated, are employed to—
 1. Exploit success or friendly nuclear fires.
 2. Maintain the momentum of the attack.
 3. Defeat enemy counterattacks.
4. Provide security by protecting the flanks and rear of a force.
5. Reinforce the attack.
- (b) While a brigade may specifically designate a reserve, a battalion-size armor unit does not normally do so. In most cases, a battalion will include in its assault formation all available tanks and mechanized infantry. The ability of a battalion-size armor unit to shift supporting fires and to maneuver rapidly normally obviates the need to withhold a force from action to be used as a reserve.
- (c) A tank company is an assault unit and does not normally constitute or

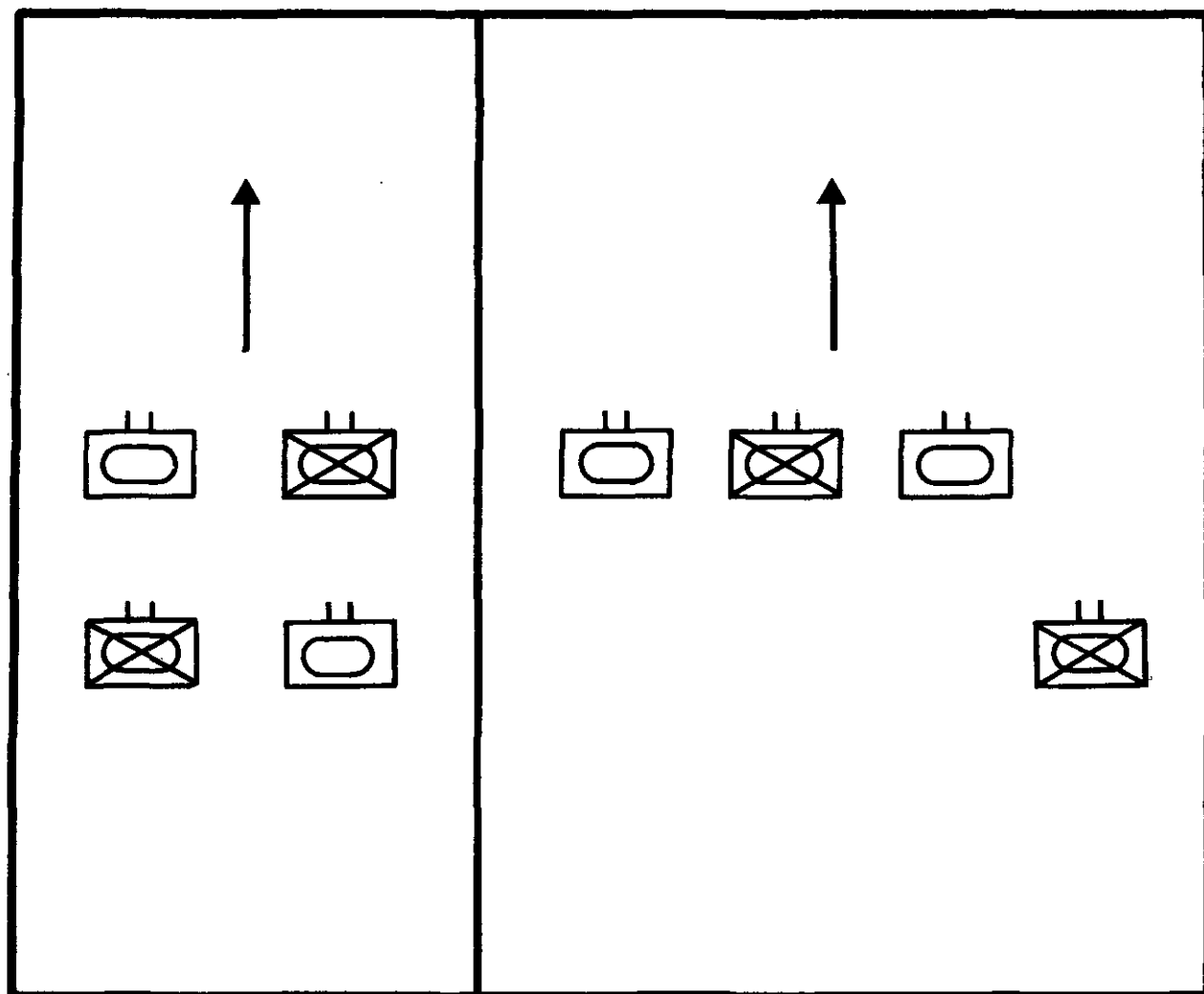


Figure 18. Variations of a line.

designate a reserve. Every effort is made by the tank company to destroy the enemy by bringing maximum mobile combat power to bear upon him at one time.

- (3) A unit not designated specifically as a reserve, but which is an active part of the attacking formation, may not be engaged actively with the enemy because of its position in the formation or for other reasons. Such a unit, although not considered as a reserve, is capable of being employed to influence the action. In addition to units specifically designated as reserves, the commander thinks of all components

of his force not engaged actively with the enemy as a potential reserve.

- (4) Committing the reserve is a matter of reasoned judgment by the commander, based on his analysis of the factors of METT.

b. Size of the Reserve. A deep objective, limited knowledge of the enemy situation, available friendly combat power, or inability to visualize the attack to its conclusion requires the retention of a stronger reserve than when these conditions do not exist.

c. Location and Movement of the Reserve. In attacks by armor units, the reserve, when designated, is part of the maneuver force. It

moves in the formation of the overall unit. In the formation, the reserve is positioned to—

- (1) Permit rapid movement to points of probable employment.
- (2) Provide security by its presence.

d. *Nuclear Weapons.* The commander normally holds a part of his nuclear weapons in reserve.

e. *Establishment or Reconstitution of the Reserve.* When the commander has all maneuver units actively engaged, he should provide for means by which he may influence the action. He may either—

- (1) Constitute forces for a reserve from other elements of the command;
- (2) Determine which unit may be most profitably disengaged if an urgent requirement for a reserve arises, or
- (3) Request additional means from higher headquarters.

189. Control Measures

In keeping with the philosophy of armor, only the control measures necessary to coordinate maneuver and fires are imposed upon subordinates by the commander. For a discussion of control measures, see appendix X.

190. Methods of Attack

a. *General.* The maneuver force, composed of tanks and mechanized infantry, accomplishes its mission by closing with and destroying the enemy. There are three general methods of attack employed by the maneuver force.

- (1) The maneuver force attacks in a single direction.
- (2) The maneuver force attacks in two or more converging directions.
- (3) Tanks of the maneuver force support by fire only.

b. *Maneuver Force Attack in a Single Direction.* In this method, the entire maneuver force closes on the enemy in a single direction.

- (1) *Coordination.* Because the force attacks in the same direction, coordi-

nation between, and control of, elements of the force are facilitated.

- (2) *Mutual support.* All elements of the force are together throughout the attack. Mutual support by elements within the maneuver force is facilitated.

c. *Maneuver Force Attacks in Two or More Converging Directions.* In this method, the maneuver force closes on the enemy from more than one direction.

- (1) *Surprise.* An attack that converges on the enemy from more than one direction forces him to fight in more than one direction simultaneously and may achieve surprise.
- (2) *Coordination.* When elements of the maneuver force are attacking over different terrain with varying enemy resistance, the coordination and control necessary to insure a coordinated attack and simultaneous assault may be difficult to achieve. Measures must be taken to prevent elements firing into each other.
- (3) *Mutual support.* The separate directions used by the maneuver force make mutual support between elements of the force more difficult than in the single-direction attack.

d. *Tanks of the Maneuver Force Support by Fire Only.* The only justification for this method of attack is under conditions where terrain or enemy-emplaced obstacles prevent tanks from moving with the maneuver force. This method does not take maximum advantage of the mobility, shock effect, and combat power of tanks.

e. *Selection of a Method of Attack.* During an attack, any one or more of the three methods of attack may be used. As the situation changes, the commander is alert to vary his method of attack. The factors of METT are analyzed in selecting a method of attack and are discussed in FM 17-15.

Section IV. CONDUCT OF THE ATTACK

191. The Advance to the Assault

a. The advance to the assault is conducted from a line of departure to close with an enemy force. The advance is conducted in a manner to minimize casualties to the maneuver force while positioning combat power to impose maximum destruction on the enemy.

b. The maneuver force conducts the advance to the assault as a continuous, rapid movement, to insure that it passes through the enemy's fields of fire in minimum time.

c. The advance to the assault is conducted in mass (app. XIII).

d. Throughout the advance to the assault, the commander supervises the execution of his plan and continues his estimate. He keeps abreast of the situation as it develops to determine if changes must be made in the scheme of maneuver or plan of fire support.

192. Tank/Infantry Teamwork During the Advance to the Assault

a. *General.* Armor operations are based on the combined arms concept in which each arm contributes its peculiar capabilities to the combat power of other forces of the overall force. To weld the capabilities of infantry and tank units into one effort, the commander considers the following relationships between tanks and infantry in the advance to the assault.

- (1) Whenever possible, tanks lead the attacking formation in order to take maximum advantage of their capability for mounted combat.
- (2) It is desirable that the infantry remain mounted as long as possible so that—
 - (a) The accompanying infantry can move forward at the speed of the tanks to rapidly close with and destroy the enemy.
 - (b) The battlefield mobility of both elements of the tank-infantry team will be retained.
 - (c) Casualties will be minimized in areas swept by small arms and artillery fire.

(d) Artillery airbursts can be employed over the attacking force.

(e) Some protection will be afforded against nuclear weapons.

(f) The infantry can conserve energy to be better able to fight when needed.

(3) Infantry normally dismount when it is necessary for them to—

(a) Breach or remove obstacles that are preventing the forward movement of the tanks.

(b) Assist in the neutralization or destruction of antitank weapons that are holding up the forward movement of the tanks and armored personnel carriers.

(c) Lead an attack through heavily wooded areas or very rough or broken terrain.

(d) Lead an attack across defended rivers that cannot be crossed by armored personnel carriers or forded by tanks.

(e) Take part in an attack through fortified areas or defended towns and villages that cannot be bypassed.

(f) Assist the tanks forward under certain conditions of low visibility and restricted fields of fire (darkness, smoke, heavy woods, broken terrain, etc.).

b. *Mounted Infantry.*

- (1) Tank and mounted infantry actions are coordinated by combining these elements into one mutually supporting formation positioning them in the formation according to the tactical situation. In determining the location of the carriers, the commander must consider the primary requirement for having the mechanized infantry readily available when required, in conjunction with the vulnerability of the APC to enemy fire. The armored personnel carriers can provide additional flank and rear security to the

maneuvering force during the attack by employing their vehicular-mounted machineguns.

- (a) When undue enemy interference is not anticipated, the carriers will follow more closely behind the tanks.
- (b) Where hostile antitank fires are encountered, the location of the carriers with relation to the tanks will depend partially on the type and caliber of the hostile antitank weapons. If the enemy is equipped with only short range antitank weapons, such as rocket launchers, the carriers may follow the tanks more closely than if the enemy were using long range, high velocity antitank weapons.
- (c) The distance between the tanks and carriers must not become so great as to lose mutual support between the tanks and mechanized infantry.
- (d) In terrain affording numerous defilade positions, the mechanized infantry may follow the tanks more closely.
- (e) The carriers can follow the tanks more closely during darkness or periods of limited visibility.

(2) The rate of advance of mounted infantry is based on the actions of the leading tank units.

- (a) When the tanks are advancing in mass, the following mounted infantry may advance in mass or by bounds. Mounted infantry moving by bounds stays behind the tanks and moves forward rapidly from cover to cover as the advance of the tanks uncovers successive defilade positions.
- (b) When the tanks are employing fire and movement, mounted infantry advances by bounds as described above.

c. Dismounted Infantry.

- (1) When mechanized infantry is required to dismount, tanks and infantry operate sufficiently close together to provide mutual support. The infantry

may move between tanks, or immediately in rear of them. As the advance progresses, the relative positions of tanks and infantry are adjusted according to the enemy resistance and the terrain. This permits close coordination and maximum mutual support but sacrifices speed, making the tanks more vulnerable to antitank fire.

- (2) When terrain, obstacles, or enemy antitank weapons restrict or stop the movement of the tanks but permit infantry to move forward, tanks may support by fire while the infantry advances. As conditions permit, the tanks should move forward, pass through the infantry, and lead the assault on the objective.
- (3) The armored personnel carriers should follow close enough behind infantry to be readily available when needed to continue the attack mounted or to assist in the consolidation of the objective. They may move forward by bounds, or follow closely the attacking force and augment the fires of the tanks and infantry with their vehicular weapons.

193. The Assault

The desired goal in the assault is to bring the maximum combat power of tanks, mechanized infantry, and the base of fire to bear upon the enemy simultaneously and to destroy him as rapidly as possible with minimum casualties to friendly forces. The assault of a defended position by tanks and mechanized infantry in coordination with the base of fire may take 1 of 3 forms—

a. Tanks and Dismounted Infantry Assault in Coordination.

- (1) Regardless of the method of attack used to bring the force into the assault position, the assault is conducted as a coordinated effort. As the force approaches the objective, the objective is under heavy fire from the base of fire. The tanks maintain their rate of advance, and increase the volume of fire on the objective. As the tanks ap-

proach the objective, the mechanized infantry moves quickly to dismount positions to support the tanks. As the tanks move onto the objective, mortar and artillery overhead time fires are shifted to the flanks and far side of the objective. The local commander determines when and where the mechanized infantry will dismount taking maximum advantage of defilade for the armored personnel carriers.

- (2) As the tanks continue their assault to the far side of the objective, the infantry follows and protects them by engaging infantry-type targets, including individual antitank weapons and tank killer teams. Coordination should be accomplished before the attack to maximize infantry support of tank elements during the assault. Whenever possible, the machineguns of the armored personnel carriers are used to support the assault until their fires are masked by advancing riflemen. The riflemen use assault fire to close with the enemy. The shock effect of assaulting tanks and infantry is multiplied by rapid movement and heavy volume of fire. During this time, the tanks continue to engage and destroy enemy positions and weapons with their machineguns and main tank gun. As the tanks arrive at the far edge of the objective, fire is directed on the enemy positions beyond the objective area.

- (3) Once the assault has cleared the objective, the carriers are moved forward to remount their squads for continuation of the attack. They should be moved forward under control to avoid "cruising" the objective searching for their squads. The following techniques may be employed to move carriers forward under control.

- (a) *Radio.* Armored personnel carriers are provided with radios that net with those carried by the dismounted infantry. The range of the transmitting station must be con-

sidered with respect to the position of the carrier and the driver must constantly monitor the radio.

- (b) *Messenger.* A dismounted messenger may be sent to the position occupied by the carriers to guide them to their respective units. This is the slowest method and depends on a route clear of the enemy.
- (c) *Pyrotechnic devices.* A pyrotechnic signal may be fired to indicate to drivers the time to move and the approximate location of the unit. This technique requires constant scanning of an area by the driver, good visibility, availability of pyrotechnics to which this meaning may be assigned, and possession in the unit of the signal device.

b. Tanks and Mechanized Infantry in the Mounted Assault. In some situations, because of the nature of the terrain or of limited enemy resistance, it may be unnecessary to dismount the mechanized infantry. The decision to keep the infantry mounted is up to the local commander at the time and can rarely be preplanned. The mounted assault differs from the dismounted assault in the employment of supporting fires. In the mounted assault, integrated forces may assault the objective under cover of overhead artillery and mortar fire. Tanks and mounted mechanized infantry overrun the objective. If necessary, supporting fires may be shifted to isolate the objective, and mechanized infantry, as required, dismounts to mop up.

c. Tanks Support by Fire. Terrain or obstacles may make it impossible for tracked vehicles to join in the assault. In this situation, mechanized infantry (dismounted) will conduct the assault. Tanks support by fire, with full consideration given to the long range and rapid rate of fire of the tank weapons and the precision and control with which these fires can be delivered. As soon as the situation permits, tanks will rejoin the mechanized infantry and, if appropriate, again lead in the attack.

194. Continuation of the Attack

a. General. Armor units seek to conduct the attack as a single advance and assault that

continues until the assigned objective is seized. The momentum of the attack must be maintained. When intermediate objectives must be seized, armor units strive to avoid halting. If there is no requirement to hold the objective, the tanks and mechanized infantry continue the attack, reorganizing on the move. If the objective is to be held, the unit will consolidate, reorganize, prepare to repel enemy counter-attack and continue the attack on order.

b. Intentions of the Higher Commander. The overall plan of attack contained in the "concept of operation" is an expression of the commander's intentions. Subordinate commanders require a full understanding of the purpose of the operations, so that they may exercise initiative in continuing the attack without waiting for further orders.

c. Continuous Reorganization. All steps are taken to maintain the combat effectiveness of the unit. Whenever possible, this is done while on the move. To save time, actions that cannot be accomplished on the move are preplanned.

d. Supporting Elements.

- (1) Combat support elements are kept well forward in order to provide immediate assistance to the combat elements.
- (2) If contact with the enemy is lost, reconnaissance and security units, especially those with air vehicles, are employed to regain contact.
- (3) Combat service support elements seek every opportunity to supply the combat and combat support units with the means required to continue the attack.

195. Consolidation and Reorganization

a. General. The actual occupation of the objective is the critical stage of the attack. Control is most difficult and it is the time when an aggressive enemy delivers a carefully planned and coordinated counterattack, supported by all available fires. When possible, the seizure of the objective should be followed by an immediate continuation of the attack. In nuclear warfare, a rapid move to dispersed locations from which the unit can dominate the objective will avoid presenting a lucrative nuclear target. In

many situations, small armor units will be required to hold an objective. In these cases, consolidation of the objective is required and the unit should be reorganized.

b. Consolidation. Consolidation pertains to all measures taken to use a newly captured position or terrain feature against the enemy. The action may vary from a rapid redistribution of forces and security elements on the objective to the organization and detailed improvement of the position for defense. When consolidation is anticipated, many of the actions can be preplanned and announced initially in the attack order. These instructions may be changed or supplemented by fragmentary orders as the attack progresses. Actions to be taken include—

- (1) *Security.* Observation or listening posts are established; and, if required, patrolling is initiated.
- (2) *Reconnaissance.* In addition to the reconnaissance efforts to effect security, commanders take steps to reconnoiter in anticipation of immediate and future missions.
- (3) *Positioning.* Tanks are positioned on armor avenues of approach and mechanized infantry cover infantry avenues of approach. Combat support and combat service support elements are relocated if necessary.
- (4) *Fire planning.* While fire planning is continuous in an operation, specific actions may be preplanned and executed for a consolidation. Registration is completed when possible, and integrated fire plans are prepared to support the consolidation. If the time for the continuation of the attack is not known, tank commanders begin preparation of individual range cards.

c. Reorganization. Reorganization includes all measures taken to maintain the combat effectiveness of the unit. Reorganization is continuous throughout the attack, but halts for consolidation offers opportunities to accomplish those activities that are difficult to do on the move. Actions to be taken include—

- (1) *Reports.* Units report their location and status to assist the next higher

commander in his planning for subsequent operations.

- (2) *Casualties.* Casualties are replaced as soon as possible or men are reassigned within the unit to cover the loss of key personnel.
- (3) *Evacuation.* Plans made before the attack for the evacuation of casualties, prisoners of war, and damaged equipment are implemented.

(4) *Supply.* Ammunition and equipment are redistributed within the unit if necessary. Basic and prescribed loads of supply are reconstituted as time permits.

(5) *Control.* New communication plans are made or old ones revised as required. Command and control facilities are located to control the consolidation and anticipated future actions.

Section V. TYPES OF OFFENSIVE OPERATIONS

196. General

Offensive operations that armor units conduct, or in which they participate, are the penetration, envelopment, turning movement, and exploitation (including pursuit).

197. Penetration

a. General. The penetration is an operation in which the attacking force passes through the enemy's defensive position, ruptures it and neutralizes or destroys objectives to break up the continuity of his defense. The penetration is accomplished by means of three tasks: rupturing the enemy defensive position; holding or widening the gap; and overrunning or seizing deep objectives that destroy the continuity of the enemy defense and create an opportunity for exploiting the breakthrough. Armor units participate in the penetration by accomplishing 1 or more of the 3 tasks by maneuver forces or, under some circumstances, by fire alone.

b. Rupture of the Position.

- (1) The rupture of the enemy defensive position is made by a violent attack on a relatively narrow front by forces strong enough to overwhelm the defenses and open a gap to permit highly mobile forces to pass rapidly through to exploit the enemy's rear. The employment of nuclear weapons may allow attack of the defense positions on a broader front.
- (2) The attack is planned and coordinated carefully to insure that the assault has sufficient force and momentum to overcome the enemy's defenses.

(3) Preparatory fires are used in the rupture to weaken the enemy defense and neutralize his reserves. Enemy forces isolated during the rupture may be neutralized by fire.

(4) The rupture must be completed and widened as rapidly as possible to avoid reinforcement or blocking actions by enemy reserves or to prevent engaged enemy forces from adopting delaying tactics.

c. Holding or Widening the Gap. Holding or widening the gap may be accomplished by maneuver forces or by fires, or both. Actions are aimed at preventing the movement of enemy forces into or out of the area of operations. Enemy counterattacks are engaged rapidly with reserve units or fires. Desirably, it is performed by fires or by other forces to avoid dissipating the maneuver forces available for the third task.

d. Destroying the Continuity of the Defense.

- (1) Armor units participating in a penetration expend every effort to maintain the violence and momentum of the attack. Overrunning the enemy or an attack deep in the enemy rear that disrupts the continuity of his defenses requires friendly forces to have relatively greater battlefield mobility than that of the enemy.
- (2) As the rupture is completed, the tempo of the attack is increased to create an opportunity to exploit deep into the enemy rear.

e. Exploiting the Penetration. The force given the mission of exploiting the penetration

may be uncommitted until the rupture is completed or may be committed to hasten the penetration. In the latter event, it executes a passage of lines through the force making the rupture to continue the attack with unrelenting pressure on the enemy.

198. Envelopment

a. General. The envelopment is an operation in which the attacking force avoids the enemy's main defensive strength by going around it on the ground or over it by air to seize an objective in his rear and disrupt his communication and support, cut his escape routes, and subject him to destruction in position.

b. Considerations of the Envelopment.

- (1) A successful envelopment requires that the enemy have an assailable flank. An assailable flank may be created by nuclear weapons or by a successful penetration.
- (2) An envelopment of both enemy flanks simultaneously usually requires greater superiority in combat power than that normally available to the units considered in this manual.
- (3) Fixing the enemy in position is accomplished by fires or, if required, by a supporting attack. Although favored as the enveloping force, armor units may participate in the envelopment by executing a supporting attack.
 - (a) A supporting attack fixes the enemy by striking him with enough combat power to—
 1. Seriously threaten the enemy forward defensive positions.
 2. Force premature commitment of enemy reserves.
 - (b) Fixing the enemy is accomplished by fires to allow the maximum number of maneuver elements to be placed in the enveloping force.
- (4) Maneuvering around the assailable flank is accomplished by the enveloping force.
 - (a) The enveloping force seizes terrain that dominates enemy supply lines

and avenues of escape or reinforcement.

- (b) The enveloping force may make a close or wide maneuver.

1. A close maneuver occurs when fire support elements (normally artillery) are capable of easily supporting the enveloping force and the supporting attack force, if any, from a central location.

2. A wide maneuver occurs when the enveloping force moves at such a distance from the supporting attack, if any, that fire support elements can support both only with difficulty. Enveloping forces conducting a wide maneuver may be accompanied by fire support elements.

- (c) When there is opportunity, the seizure of the objective by the enveloping force may be followed by an exploitation.

- (5) The success of the envelopment depends largely upon surprise and mobility of the enveloping force, and the ability of the supporting fires or attacks, if any, to fix the enemy in position.

- (6) Rapid movement of the enveloping force and application of a supporting attack, if required, are essential to prevent the enemy's movement of reserves to occupy previously prepared positions.

c. Conduct of the Envelopment.

- (1) A supporting attack may be launched at the same time as the attack of the enveloping force, or earlier to increase deception.
- (2) Preparatory fires for the attack of the enveloping force may be omitted in the interest of secrecy. If used, these fires may be intense but of short duration.
- (3) A supporting attack, when such is necessary, that is conducted aggressively and violently may lead to an opportunity to convert the supporting attack into a successful penetration.

- (4) The enveloping force moves rapidly and directly to the objective, bypassing enemy forces that cannot interfere with the accomplishment of the mission. If the enemy attempts a frontal attack against a supporting attack, the enveloping force continues to the objective while the supporting attack force blocks or delays.
- (5) Enemy counterattacks that threaten the accomplishment of the mission by the enveloping force are engaged in a manner similar to the meeting engagement (pars. 209-211).

199. Turning Movement

In the turning movement the attacking force avoids an enemy force and seizes an objective deep in the enemy rear to force him to abandon his position or divert major forces to meet the threat. The enemy is then destroyed on ground of the attacker's choosing. Normally, brigade and lower units participate in the turning movement as part of a larger force. For details of turning movements see FM 61-100.

200. Exploitation

a. Purpose. In the exploitation the attacker seeks to follow up the gains of success in battle. The attacker drives deep into the enemy's rear to destroy his means to reconstitute an organized defense or to withdraw in good order.

b. The Pursuit. The pursuit is the final phase of the exploitation. Its goal is annihilation of the enemy force. It is accomplished by maintaining direct pressure on the withdrawing enemy and by intercepting and destroying the main enemy force.

c. Consideration of the Exploitation.

- (1) Opportunities for major exploitations are indicated by an increase in prisoners captured, in abandoned equipment, and the overrunning of artillery, command facilities, signal installations, and supply dumps. The transition from the attack to the exploitation may be abrupt or so gradual as to be hardly distinguishable.
- (2) Speed and combat power are required in exploiting forces.
- (3) In the exploitation, class III consumption rates are high, and provisions for rapid supply are essential. Security of supply columns must be considered since forward elements may be behind enemy forces.
- (4) Minimum necessary control measures are used. The decentralized execution characteristic of the exploitation requires the exercise of great initiative on the part of all leaders.
- (5) In the exploitation, nuclear, conventional, and chemical weapons may be used principally on targets of opportunity. Fire support units march with or immediately in rear of exploiting forces.
- (6) Reconnaissance efforts are intensified. The rapid gaining of information on enemy activities and strength coupled with information of the terrain assist the commander in making decisions involving the bypass or changes in the scheme of maneuver.

d. Conduct of the Exploitation.

- (1) Exploiting forces advance rapidly on a broad front. Only the reserves necessary to insure flexibility, momentum, and essential security are retained.
- (2) Once the exploitation is begun, it is carried relentlessly to the objective deep in the enemy rear to cut his lines of communication and disrupt his command and control.
- (3) Maximum use should be made of air vehicles to increase the reconnaissance and security of the exploiting force. Air vehicles may be used to assist in seizing terrain that becomes key to the tactical success of the exploiting force.
- (4) Enemy forces encountered are not engaged unless they can interfere with the accomplishment of the mission. The avoidance of combat under these circumstances is termed a bypass. Based on the factors of METT, information gained from efforts to develop the enemy situation and the determination of suitable bypass routes, the

commander may attack, block, or bypass the enemy. If his decision is to bypass, he must determine the possible effect the bypassed enemy force may have on his mission and the mission of the larger force. If the enemy force can hinder movement during the bypass, a force may be employed to block the enemy. Armored cavalry elements or air vehicles may be used to facilitate movement around an enemy force. For techniques of the bypass see paragraphs 212 through 214.

- (5) Commanders use all means and weapons to overrun enemy forces that cannot be bypassed.
- (6) Meeting engagements may occur frequently in the exploitation. For a discussion of the considerations and conduct of meeting engagements, see paragraphs 209 through 211.
- (7) Following and supporting units normally follow armor units in the exploitation to relieve them of time-consuming tasks that dissipate the combat power of exploiting forces.
- (8) As enemy demoralization begins and enemy forces disintegrate under pressure, exploitation may develop into pursuit.

e. Considerations of the Pursuit.

- (1) Armor units participate in the pursuit by—
 - (a) Maintaining direct pressure on the withdrawing enemy by a maneuver force that seeks to engage the withdrawing enemy's main body. This direct pressure force attacks constantly to overcome or bypass the enemy's rear guard.
 - (b) Intercepting and destroying the main enemy force by a highly mobile encircling force that seeks to get in rear of the enemy force to block his withdrawal. Once this is accomplished, the enemy is destroyed between the direct pressure force and the encircling force. If the encircling force cannot out-

distance the enemy, it attacks the flank of the enemy main body.

- (2) Successful pursuit requires unrelenting pressure against the enemy to prevent reorganization and preparation of defenses. Commanders may take greater risks to achieve decisive results. In the interest of the tremendous gains at stake, troops and equipment are pushed to the limit of their endurance.
- (3) Destruction of the enemy force is the primary objective of the pursuit.
- (4) Adequate preparation is made for logistical support. Class III consumption is particularly high. Air transportation may be used for rapid delivery of supplies to forward units. Maximum use is made of captured enemy materiel.

f. Conduct of the Pursuit.

- (1) The direct pressure force attacks on as broad a front as possible. When tack continues day and night. When conditions permit, elements of the enemy force are enveloped or cut off. If the enemy main force establishes itself on a position, the direct pressure force attacks in an effort to dislodge it.
- (2) The encircling force attacks along an avenue of approach that facilitates early engagement or interception of the withdrawing enemy force. Formations are used that contribute to control and speed of movement.

201. Infiltration

a. Infiltration is a technique of movement used in conjunction with several types of offensive actions. In the attack, its purpose is to deploy strong forces in the enemy rear while exposing only small forces to enemy defensive fires.

b. The movement and assembly of forces by stealth among enemy positions is a slow operation. While dismounted mechanized infantry or armored cavalry units are most suitable for infiltration, tank units can be carefully infiltrated by taking advantage of faulty enemy dispositions, gaps created in obstacles without

enemy knowledge, or by diversionary attacks by fires or maneuver forces.

c. Planning for infiltration must be detailed and coordinated closely into the overall plan of attack. Deviation from plans is difficult to coordinate once movement has begun. Linkup plans or plans to extricate the force must be prepared.

d. Infiltration lanes, assembly areas, attack positions, and objectives are the control measures used primarily; phase lines and checkpoints assist in control while rallying points or areas are required for units that become scattered and disorganized.

e. The infiltrating elements in small groups pass through, over, or around enemy forward defensive positions. They avoid detection, and if detected, avoid decisive engagement. They

normally move over multiple lanes, to assembly areas adjacent to their objectives. Closely coordinated demonstrations and fires in areas not included in the infiltration may be used to assist their movement. Fires in the area of infiltration may serve to reduce the enemy's surveillance capability.

f. Upon arrival at the assembly area, the infiltrating unit prepares for action, deploys, and at the appropriate time, executes its mission. Consolidation includes preparations for linkup or withdrawal.

202. Advance to Contact

An advance to contact is a ground movement conducted to place troops in position to engage the enemy. It takes place whenever a unit moves to establish or regain contact with an enemy force. For a detailed discussion see FM 61-100.

Section VI. PASSAGE OF LINES

203. General

The commitment of a unit through one which is in contact with the enemy constitutes a passage of lines. A passage of lines may be required to continue the momentum of the attack or to exploit a weakness in the enemy position. A passage of lines requires careful planning and close coordination between the units. Due to differences in organization and techniques of operation, the passage of armor through infantry is more difficult than is its passage through another armor unit.

204. Planning for Passage of Lines

a. *Scheme of Maneuver.* The scheme of maneuver is based on the factors of METT. The scheme of maneuver normally determines the location at which the passage of lines will take place.

b. *Reconnaissance.* A thorough reconnaissance should be made by commanders and key members of the unit making the passage. This reconnaissance should cover routes to the area of the passage, the area itself, existing troop locations, proposed positions, and, if necessary, proposed locations of individual combat vehicles. A visual reconnaissance should be made of the area forward of the frontline position; air

vehicles may be used in this reconnaissance. In reconnoitering, care must be taken not to alert the enemy by offering indications that a passage of lines is to be made. It may be necessary to limit the number and size of reconnaissance parties, or it may be advisable to use ground and air vehicles of the units in contact.

c. *Intelligence.* The units in contact should provide to the unit making the passage all possible information of the enemy and the terrain to their front, including strength, disposition, and composition of enemy forces; and location of enemy armor, antitank weapons, and obstacles.

d. *Fire Support.* The fire support agencies of the units in contact are normally integrated into the fire support plan of the unit making the passage. Artillery liaison officers, forward observers, forward air controllers, and mortar platoon leaders of the unit making the passage should contact their counterparts in the unit in contact, to exchange information and develop the details of the fire support plan.

e. *Priorities of Routes and Areas.* The higher headquarters directing the passage normally establishes an overall priority on routes and areas. If it does not, a priority must be established between the commanders concerned.

Complete information on routes to be used and areas to be occupied should be disseminated as early as possible, to avoid confusion and delay.

f. Movement Through the Area. The routes established for movement into the forward areas must be well marked and controlled. Ideally, the passing unit and the unit in contact provide guides down to platoon level. As a minimum, the units in contact provide guides. Guides lead elements of the passing unit through the unit in contact along prearranged routes. For increased security, the movement into the forward areas may be conducted at night; this requires stringent control and thorough planning and reconnaissance. Artillery fire may be employed during the movement, to cover the noise of the vehicles. If the movement is conducted during daylight, smoke may be placed on known enemy observation posts and forward positions. While the passing unit and the unit in contact are together in the area, the resulting concentration presents a good target for enemy nuclear attack. Therefore, the passage should be completed as quickly as possible. During the period of concentration, maximum passive defense measures against nuclear attack should be taken.

g. Control Measures. The type and number of control measures will depend upon the seasoned judgement of the commanders involved but will normally be more restrictive than those used in other operations. For a discussion of control measures, see appendix X.

205. Liaison and Coordination in Passage of Lines

a. Liaison. As soon as it is determined that a passage of lines will be made, liaison must be established between the passing unit and the unit in contact. At brigade and battalion level, liaison officers are exchanged until completion of the operation.

b. Coordination. Thorough coordination is essential to the success of a passage of lines. Normally, the unit in contact is given the definite mission of "assisting in the passage."

Special emphasis must be placed on the following coordination measures:

- (1) Refueling areas and routes into and out of these areas are reconnoitered by personnel from the passing unit, assisted by guides furnished by the unit being passed through. It may be necessary for the unit being passed through to adjust its positions to permit a satisfactory passage, but such adjustments should be held to a minimum.
- (2) Clearing and marking the lanes through friendly minefields and obstacles to permit rapid passage are accomplished by the unit being passed through. Passing units should provide their own control personnel at difficult gaps or defiles to check through each subunit.
- (3) Details of fire support are furnished by the unit through which the passage is being made.
- (4) Details of communication nets and channels required by the passing unit are coordinated between the units and with their higher headquarters.
- (5) Within its capabilities, the unit being passed through furnishes combat service support to the passing unit during and immediately after the passage. This support may include medical facilities, handling PW's, clearing roads of refugees, and assisting in handling the dead, but normally will not include supply of class III and V.

c. Passage of Command. The time or circumstance when responsibility for the zone of action is transferred to the commander of the unit executing the passage of lines must be mutually agreed upon by the two commanders concerned. Normally, the commander of the unit making the passage of lines assumes responsibility for the zone of action at or before the time of attack. The responsibility for the zone may shift at the time of the firing of preparatory fires or earlier at the direction of the headquarters ordering the passage.

Section VII. RECONNAISSANCE IN FORCE

206. General

A reconnaissance in force is an attack to discover and test the enemy disposition, composition, and strength. Although its primary aim is reconnaissance, it may discover weaknesses in the enemy dispositions that, if promptly exploited, may permit tactical success. Terrain objectives are used that, if threatened or seized, will force the enemy to react to the threat.

207. Considerations

a. In deciding to reconnoiter in force, the commander considers the—

- (1) Knowledge of the enemy situation that he has and the urgency and importance of the information sought.
- (2) Efficiency, speed, and availability of other collection agencies.
- (3) Extent to which future plans may be revealed to the enemy by the reconnaissance in force.
- (4) Possibility that the reconnaissance may lead to a general engagement under unfavorable conditions.

b. The size of the reconnoitering force varies in accordance with the factors of METT. The force must be of sufficient size and composition to cause the enemy to react strongly and definitely to the attack, thus disclosing his forward troop locations, dispositions, and strength, in addition to the location of his re-

serves. The force is normally not less than a reinforced squadron or a battalion task force with artillery, engineer, and Army aviation support.

208. Conduct

a. Restrictions may be placed upon the commander of the force to avoid actions that might precipitate a general engagement. The higher commander is alert to exploit success gained by the reconnaissance in force, including continuation of the attack or retention of terrain seized. Suitable targets discovered by the force may be attacked by nuclear weapons, and their destruction completed by local exploitation by the reconnoitering force. The higher commander prepares to assist the extrication of the force if it becomes decisively engaged. Nuclear weapons may provide a means of doing this. Upon completion of its reconnaissance, the force may remain in contact with the enemy or withdraw. If the reconnaissance is to be followed by further attack, other units pass through the reconnoitering force in the attack or it may itself continue the attack.

b. When information is sought of a particular area, the reconnaissance in force is planned and executed as an attack with a limited objective. If the enemy situation along a front is to be developed, the reconnaissance in force is an advance employing strong aggressive probes to determine the enemy situation at key points.

Section VIII. MEETING ENGAGEMENT

209. General

a. A meeting engagement is the combat action that occurs when a moving force, incompletely deployed for battle, engages a moving or static enemy force about which it has little or no intelligence. The action ceases to be a meeting engagement when the enemy situation has been developed and subsequent operations are undertaken for the specific situation at hand.

b. Meeting engagements are characterized by—

- (1) Limited knowledge of the enemy.
- (2) Minimum time available to the com-

mander to develop the situation, formulate plans, and execute them.

(3) Rapidly changing situations.

c. Under the conditions of highly mobile warfare, with combat units dispersed laterally and in depth, meeting engagements may occur frequently at brigade and lower echelons of command. In the attack, armor forces may encounter enemy units in depth either in blocking positions or in motion.

210. Considerations

a. In each meeting engagement, the commander of the advancing force is normally confronted with three possible courses of action:

- (1) Attack directly from march formation as rapidly as his units are available for employment.
- (2) Reconnoiter and block the enemy with forces in contact until other units can be committed in a coordinated effort, either offensively or defensively, as they become available.
- (3) Attempt to break contact and bypass the enemy force.

b. The paramount objective of the commander fighting a meeting engagement is to gain and retain the initiative. In so doing he may adopt one or a combination of the aforementioned courses of action that will contribute most effectively to the accomplishment of his mission. Without the initiative, he can only react to the enemy's actions.

c. The character of the battle is such that the commander must use bold initiative to quickly develop the situation. Frequently, aggressive action must be initiated despite the vagueness and uncertainty of the situation. Mobile forces are required to develop the situation rapidly and aggressively to seize an initial tactical advantage.

d. Success in the meeting engagement requires that the enemy be kept off balance by offensive actions while the attacker retains proper balance to follow up rapidly the gains of initial actions. Accomplishment of this complex goal depends largely upon aggressive reconnaissance and rapid deployment and commitment of forces from the march formation in a coordinated effort.

e. The tempo and speed of this fight dictates that the commander take personal control with minimum reliance on written or formal instructions through normal staff channels. His decision should be based on firsthand knowledge and, if practicable, on personal reconnaissance. He should move quickly to the scene of action, make a rapid estimate of the situation, formulate a simple plan, and issue fragmentary orders to the force by radio to facilitate speed of execution.

f. Speed and combat power are required in this uncertain and vague situation. When friendly and enemy forces attack simultaneously from the march formation, fighting may

develop wherein the initiative of the engaged commanders; the experience of the troops; and the fire and striking power, particularly of tanks, will be decisive.

g. Minimum control measures are used. However, commanders at all levels must retain a firm hand on their units and not allow coordination to be impaired by the necessity of committing units rapidly or piecemeal. Lack of coordination may cause subordinate units to become engaged in individual fights that do not assist the force mission. Achievement of timely coordination regardless of the many difficulties is the mark of a skilled leader.

211. Conduct of the Meeting Engagement

a. The desired goal in the meeting engagement is to strike the enemy force continuously until he ceases to exist as a fighting entity. The armor commander must orient his forces against the enemy and strike violently and relentlessly. The terrain may offer such an advantage that it will be best to defend, inflict losses on the enemy, and then counterattack with all available forces. This is particularly true when the enemy has superior tank strength.

b. The security elements will normally be the first to contact the enemy. The initial fighting by security elements is particularly important to the successful continuation of the engagement and is of great concern to the commander. These forces must make a rapid reconnaissance as accurate information is required by the commander from the outset. They may attack or block the enemy, making it possible to occupy important terrain.

c. Forces in the march column deploy rapidly and are normally committed to the fight while on the move to achieve tactical surprise. Certain forces may be deployed adjacent to the route of march and constitute the commander's reserve.

d. Artillery supports the security forces and forces committed to the action from the march formation. Artillery units quickly move as far forward as possible to provide the required fire support. This maneuver is essential because the confines of the fight cannot be predetermined and may evolve only as the engagement continues.

e. Maneuver units direct their attacks against the flanks of a fixed enemy to produce decisive results. Frontal attacks are avoided.

f. If the enemy force is moving when contact is made, a rapid flank attack may hinder seriously his ability to deploy and maneuver his main body.

g. It is of decisive importance that the commander recognize changes in the situation in time to act accordingly. He may be required to change plans rapidly, and assign new tasks to his units already in motion to support the initial plan.

h. Units committed from the march column often encounter enemy forces in unreported locations. The action taken against them must always assist in the accomplishment of the overall mission. Adjacent and higher headquarters must be advised of this enemy contact and the commander's plan of action.

i. Commanders may be directed to bypass an enemy force. Minimum forces are employed to block the enemy and allow the uninterrupted advance of the main force. Blocking forces will initially be security elements and should be relieved of this mission as rapidly as possible by units that have a follow and support role.

Section IX. PROCEDURES AND TECHNIQUES OF THE BYPASS

212. General

a. In a bypass operation the commander deliberately avoids offensive combat with an enemy force, position, or installation, to avoid dissipation or diversion of his combat power to efforts other than accomplishment of his mission. Bypass operations are particularly applicable during the exploitation, pursuit, or other offensive action when the enemy force encountered is of insufficient strength to jeopardize the accomplishment of the unit's mission.

b. Authority to bypass is delegated by higher headquarters but is not normally delegated below task force level. Because of the extended front over which the armored cavalry squadron normally operates, authority to bypass may be delegated down to troop level.

c. Regardless of the level to which authority has been granted, the commander executing the bypass immediately notifies the next higher commander of his intention and reports on the enemy force to be bypassed and circumstances of the bypass.

213. Considerations

a. The first consideration in the decision to bypass an enemy force is an analysis of the factors of METT.

b. Initially, limited information of the enemy may be available. Aggressive action must be initiated to develop the situation to obtain accurate detailed knowledge of the enemy.

c. Minimum time is available to develop the

situation and formulate plans to hasten execution of the bypass.

d. Mobile forces are required to develop the situation rapidly and aggressively and to locate possible bypass routes.

e. The availability of follow-and-support forces may influence the commander's decision to bypass an enemy force.

214. Conduct

a. *Developing the Situation.* When enemy contact is made, engaged friendly forces deploy, develop the enemy situation (location, strength, composition, and disposition), choose a course of action, and report to higher headquarters. Concurrently with actions to develop the situation, reconnaissance is conducted to locate possible bypass routes. If available, armored cavalry elements or air vehicles may be employed to facilitate the reconnaissance of enemy positions and possible bypass routes.

b. *Techniques of the Bypass.* One, or combination, of the following techniques may be employed:

- (1) Block the enemy by fire and bypass with the maneuver elements.
- (2) Block the enemy with part of the maneuver elements and bypass with the balance of the force (fig. 19).

c. *Actions of the Blocking Force.*

- (1) Normally the blocking force will engage the enemy until the maneuvering elements have completed their bypass

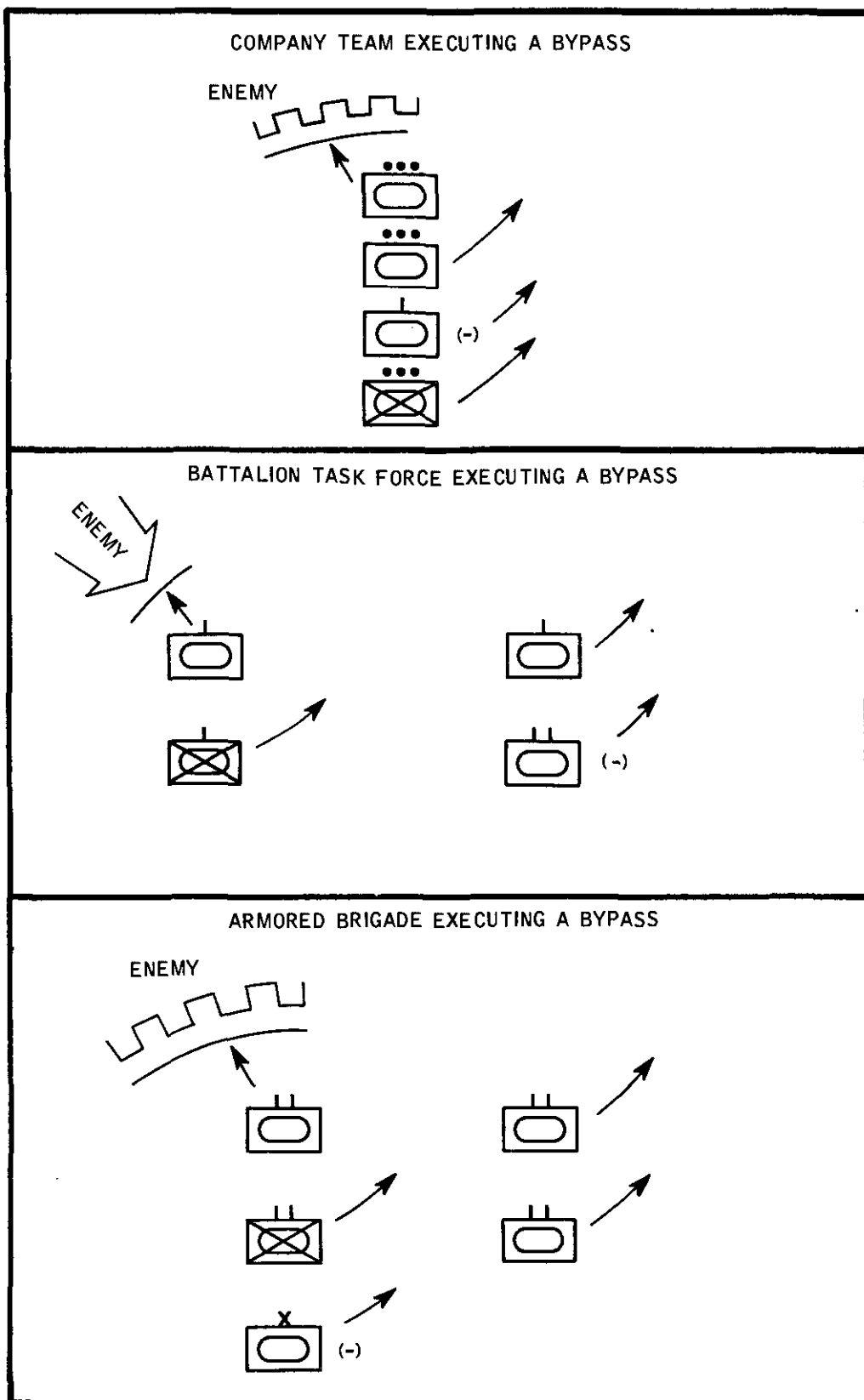


Figure 19. Examples of the bypass.

and then disengage from the enemy to rejoin the maneuver units. The blocking force normally employs defensive, delaying, and limited offensive actions in this type operation.

- (2) The commander conducting the bypass as the next higher commander may direct the blocking force to block and maintain contact with the enemy until relieved by follow-and-support forces. This may require the blocking force to

be reinforced with combat support elements since a combination of offensive, defensive, and delaying actions are employed to accomplish this mission. The blocking force commander coordinates with the follow-and-support force commander as early as possible and provides him with all available information about the enemy and terrain. Concurrently with this action, the blocking force commander plans to rejoin the main force.

Section X. NIGHT ATTACKS

215. General

a. Night attacks and night operations offer excellent opportunities for achieving deception and surprise and thus enhance success in battle. Night combat is applicable to all offensive operations and is used habitually in battle.

b. Night combat that achieves surprise may offer opportunities for success when daylight operations are impractical. This is especially true when friendly forces lack air superiority. Continuous pressure applied day and night, particularly against a weakening enemy, hastens decision. Relentless exploitation around the clock denies the enemy time for regaining his *composure* and speeds his destruction.

c. Troop movements, concentration of forces before the attack, and the conduct of the attack may result in minimum risk to friendly forces and fewer casualties.

d. Very hazy or rainy weather, fog, falling snow, and smoke conditions similar to darkness should be taken advantage of to conduct offensive operations.

e. The fundamentals involved in night operations are the same as those in daylight operations; however, techniques may vary. For example, more control measures may be placed upon units during night operations than during daylight operations.

f. Battlefield illumination and surveillance equipment increase the efficiency of units operating at night and facilitate the employment of supporting fires.

216. Basic Considerations of Night Attack

a. Successful night attacks depend on prior reconnaissance, simple plans, effective control

measures, troop night training, and the enemy's night surveillance capability.

b. The objective of a night attack is limited in depth generally by the difficulty in maintaining control, particularly after the enemy has been alerted.

c. The night attack is characterized by a decrease in the effectiveness of aimed fire on the enemy and a corresponding increase in the importance of close combat and supporting fires.

d. Night attacks require detailed and careful planning. This is particularly true of night attacks against organized resistance. Simple plans and formations facilitate night operations and enhance control and coordination.

e. Morale of troops, both friendly and enemy, is highly sensitive to physical and psychological factors. Troops trained and conditioned in night operations can use these psychological factors to their advantage.

f. The paramount consideration is that the attacking troops be as familiar as possible with the terrain over which they will attack. It is desirable to employ troops in night operations that have not been engaged in fighting all day. Troops become fatigued more easily in night combat due to the added physical and psychological stress and strain.

217. Planning the Night Attack

In general, planning for the night attack is similar to that of a daylight attack. However, plans for the night attack are in greater detail with stringent control measures to insure coordination within and between attacking and sup-

porting elements. Subsequent paragraphs will discuss areas that require emphasis in planning offensive operations at night or under conditions of reduced visibility.

a. General. The commander's decision to conduct a night attack must be disseminated to subordinate leaders in time to provide them an opportunity for reconnaissance, detailed planning, and coordination. The amount of planning will depend on the time available, especially when armor units are continuing a daylight attack into the night. The commander must consider the inherent risks in such an attack. Nevertheless, attacks in progress are not discontinued merely because of nightfall. Brigades and subordinate units in the attacking echelon plan to continue the attack through the night unless ordered otherwise.

b. Reconnaissance. Daylight reconnaissance by all leaders is desirable in preparing for night operation. Air photographs of the area over which the attack is to be conducted should be obtained and distributed at least down to company level. Daylight reconnaissance of terrain not held by friendly troops may be accomplished by observation from Army air vehicles and from vantage points controlled by friendly units in contact. It may be necessary to send out patrols to obtain detailed information of the terrain and of the location and strength of enemy security elements. Every effort is made to locate enemy minefields and plans are made to breach these and other obstacles before the attack.

c. Surprise and Security. In a night attack, surprise is obtained mainly through secrecy. Measures to obtain secrecy include—

- (1) Restricting the size and time of parties engaged in reconnaissance and other preparations.
- (2) Using artillery and mortar fire to cover the sound of tanks and armored personnel carriers.
- (3) Conducting local attacks in areas not designated for the night attack.
- (4) Attacking at a time and from a direction heretofore not used against the enemy. Set patterns, including methods of attack, are avoided.
- (5) Illuminating areas other than the attack area, to mislead the enemy.

d. Control Measures. The following control measures are normally used in the night attack:

- (1) *General.* Attack positions, line of departure, contact points, boundaries, direction of attack, and objectives, as discussed in appendix X.
- (2) *Limit of advance.* To retain control and prevent the assault echelon from being endangered by friendly fires, the commander establishes a limit of advance beyond and to the flanks of the objective past which friendly troops do not go. This limit should be easily recognizable under conditions of reduced visibility and far enough beyond and to the flanks of the objective to allow space for security elements to perform their mission. Fire support agencies can engage enemy forces beyond this line without clearance from the supported unit.
- (3) *Point of departure.* That point on the ground where the attacking platoons cross the line of departure.
- (4) *Probable line of deployment.* An easily identifiable terrain feature (road, trail, etc.) at which it is planned that attacking platoons will assume their assault formation.
- (5) *Special identification means.* Personnel, vehicles, and the measures listed above may be marked to assist in controlling, directing, and recognizing. Troops may use white arm bands, white adhesive strips on helmets and luminous buttons. Tanks and armored personnel carriers may be marked on the rear. Electronic means such as infrared devices may be used to maintain control and direction. Guides and engineer tape may be used at critical points during the advance to the line of deployment. This is especially true when the attack is made through minefields or other obstacles.

e. Illumination.

- (1) If there is little or no chance of surprising the enemy, artificial illumination may be used as soon as the attack is launched. If surprise can be gained, illumination may be withheld until the

enemy places effective fires upon the attacker. In any event, illumination must be planned for and executed when the enemy fires become effective or if he chooses to illuminate the battlefield himself.

- (2) Battlefield illumination facilitates control and coordination within the attacking elements, permits delivery of aimed fire, and allows rapid minefield removal and evacuation of casualties. For a discussion of battlefield illumination see appendix XV.

f. Fire Support.

- (1) In a night attack, supporting fires are planned and controlled in the same manner as in a daylight attack. They may be employed before, during, and after the attack. To assist in gaining surprise, the attacking force may advance within assaulting distance of the objective without supporting fires. Once the assault on the objective begins, fires are delivered to isolate the objective, prevent or limit counterattacks, and support the assaulting force.
- (2) Nuclear fires may be used just before the attack to neutralize known hard targets. The employment of on-call nuclear fires should be avoided since the exact location of, and protective measures afforded to, the attacking troops may be difficult to determine. Special precautions must be taken to increase troops safety considerations because of dazzle effect at night. The creation of obstacles is to be avoided as they are more difficult to negotiate at night. Nuclear fires may obliterate landmarks that were to be used as control measures.
- (3) Normal fires are maintained before and during an unsupported attack. They do not alert the enemy to an impending attack but assist in maintaining secrecy by muffling the noise of advancing tanks and armored personnel carriers.
- (4) Positions for supporting weapons are reconnoitered and marked, and firing

data is prepared, during daylight. Weapons are moved under cover of darkness. In a night attack by a battalion task force, it may be desirable to provide all supporting fires from units not in the task force. When this is done, all the battalion's supporting weapons can follow the attacking echelon to the objective by bounds.

g. Communication. Radio is the primary means of communication in the mounted attack. Listening silence may be imposed on the attacking force to mislead the enemy as to the intentions of the moving tracked vehicles. When the enemy discovers the attack, listening silence is lifted. Dismounted mechanized infantry given the mission of breaching minefields and securing the probable line of deployment should use wire communication until the attack is disclosed. In any event, supplemental means such as pyrotechnic signals, infrared searchlights, and electronic devices are planned and employed.

218. Scheme of Maneuver

The amount of maneuver possible during a night attack depends mainly on the nature of the objective and the visibility. It is difficult to change direction. Complicated maneuvers are avoided to decrease the danger of firing on friendly troops. Attacks normally are made in one direction and in a relatively close formation to facilitate control. Nevertheless, simple maneuvers may be used by tank and mechanized infantry units employing vehicular mounted navigational aids, and infrared equipment.

a. Formations. In an attack that is not illuminated initially, tank companies cross the line of departure in line formation with platoons in column. Attached mechanized infantry may be in column behind a tank platoon. Intervals between company teams are such that units can deploy further when necessary. Deployment by platoons to line formation is made when forced by enemy action or at the probable line of deployment to attain maximum firepower and shock effect. In an illuminated attack with supporting fires or when visibility permits, platoons may employ line formation from the attack position to the objective. In any event, the rate of advance is timed to permit a simul-

taneous assault on the objective by the leading units. For a discussion of formations in a dismounted attack with tanks see FM 7-20 and FM 7-11.

b. Time of Attack. Time patterns are avoided to facilitate surprise. Consideration must be given to the mission and enemy situation. If the attack is to seize favorable terrain for a succeeding daylight attack, it may be launched during the final hours of darkness to give the enemy minimum time in which to interfere with the subsequent attack. However, attacks launched during early darkness permit the attacker to take maximum advantage of a long period of darkness and exploit the enemy's confusion and loss of control. Attacks may be initiated during darkness and continued without pause during daylight.

219. Conduct of the Night Attack

a. The attacking forces cross the line of departure at the time prescribed by the operation order. Commanders are well forward to insure aggressive movement of their units, maintenance of direction, and coordination with other units and the base of fire. All leaders must exercise close control over their elements to prevent a premature assault.

b. Enemy security forces encountered during the advance are disposed of by leading elements. This action may require engaged elements to deploy before the planned time. Adjacent units may continue to advance during this action. Following units may be committed around the flank of the engaged unit and assume its mission. After the resistance has been reduced, engaged units may re-form and follow the main

force. This technique is especially effective in an attack of a deep objective. In any event, the entire attack should not be halted because of engagement by leading elements with enemy security forces. If the enemy resistance is such that commanders may lose control or receive effective fire during the attack, visible illumination may be employed and the advance continued as a daylight attack.

c. The ideal to be achieved in the night assault is the same as in a daylight assault. Deployment by platoons to line formation is completed without halting; any prolonged halt at this stage of the operation increases the chance of detection and allows the enemy time to re-dispose his force on the objective. Mechanized infantry remain mounted until dismounted action is required. When further surprise cannot be achieved, visible illumination is initiated or increased and mechanized infantry are dismounted to allow the force to place its maximum aimed and concentrated firepower on the enemy. The key to firepower in the assault is volume. The key to shock effect is moving tracks. Every effort is made to maintain the line formation and prevent it from breaking up into isolated groups.

220. Actions on the Objective

Security elements are sent out far enough to warn of enemy forces forming for counter-attack within assaulting distance of the captured position. If they are required to go beyond the established limit of advance, their movements are carefully coordinated with the base of fire. Before daylight, all elements should be in position, prepared to continue the attack or defend the position.

CHAPTER 8

DEFENSIVE OPERATIONS

Section I. GENERAL

221. Purpose of Defense

In the defense armor units prevent, resist, repulse, or destroy an enemy attack. The purpose of the defense is to gain time pending the development of more favorable conditions for undertaking the offensive; economize forces in one area to concentrate superior forces for decisive offensive action elsewhere; destroy or trap a hostile force; reduce the enemy capacity for offensive action; or deny an enemy entry into an area.

222. Doctrine of Defense

The doctrine of defense envisions the use of security forces to provide early warning to detect, delay, deceive and disorganize the enemy attack; forward defense forces to organize the forward defense area to repel the attacker and develop the situation; and a reserve force to eject or destroy the attacker by offensive action. This doctrine also envisions capitalizing on mobility, firepower, and offensive action to establish a defense to retain the initiative; denying the attacker his decisive objectives without the defender becoming fixed and destroyed; and destroying the enemy by fire and maneuver. The nature of the operation demands adequate space for maneuver and a high degree of mobility.

223. Basic Considerations of Defensive Operations

The planning, organization, and conduct of the defense are based on the following considerations:

a. Proper Use of Terrain. Terrain is a major factor in the selection of the defensive area and the location and distribution of defending forces. The defender seeks to control key terrain features essential to observation, com-

munication and maneuver of reserves and he seeks to deny the enemy the use of terrain which might jeopardize success of the defense. Advantage is taken of obstacles to strengthen the position or to divert the enemy into areas suitable for counterattack. Obstacles in the area have a strong bearing on the general defensive scheme, including the distribution of forces and positioning of the striking force or reserves. An evaluation of the enemy avenues of approach in conjunction with key terrain features serves as the basis for positioning troops, surveillance means and fires. In an analysis of terrain, the following factors should be considered:

- (1) Key terrain.
- (2) Observation and fields of fire.
- (3) Cover and concealment.
- (4) Obstacles.
- (5) Enemy avenues of approach.

b. Security. Precautions must be taken to avoid tactical surprise by the enemy since the attacker normally retains the initiative as to the time, place, direction, and strength of the attack. Commanders provide for all-round security to insure early warning and reliable information of approaching enemy forces. All units, regardless of their size, are responsible for their own security.

c. All-Round Defense. Although the defense is designed primarily to combat an enemy attack along the most probable avenues of approach, the enemy may attack from a direction other than expected or considered likely. Also, the enemy may attack the rear by envelopment or large-scale guerrilla action. The defending unit must be capable of meeting an attack from any direction. It must not permit the enemy to gain a decisive advantage by surprise as to the direction or location of the attack. The defender prepares for all-around defense by the

careful initial disposition of forces and by the planned redistribution of troops and shifting of fires to meet contingencies.

d. Defense in Depth. Adequate depth to the defense is essential. It must be expected that a strong attack, particularly if supported by nuclear weapons, will permit the enemy to advance some distance in the defense area. There must be sufficient depth to the defense to contain or canalize the enemy and to permit execution of counterattacks. Shallow defenses are inherently vulnerable because the enemy may breach them before he can be contained or effective counteraction taken. Depth to the defense is achieved by proper deployment of forces, preparation of additional areas in depth, maneuver of forward elements to alternate areas as necessary, and use of mobile reserves in any part of the defensive area.

e. Responsiveness. The success of the defensive battle will, as in the offense, depend upon the application of superior combat power at the decisive time and place. Both maneuver units and fire support elements must be responsive to the commander's needs if this superiority is to be gained at the proper time and place.

f. Dispersion. In a nuclear situation, dispersion is an important consideration in organizing the defense to limit or minimize vulnerability to nuclear attack. The need for maximum dispersion must be balanced against certain operational requirements for concentration that may be necessary to accomplish the mission. For example, the retention of specific terrain may oppose maximum dispersion. In such cases the mission is paramount, and the degree of risk in accepting a lesser dispersion is secondary. A force that disperses laterally rather than in depth, risks isolation of its separate forward combat units, subsequent penetration by frontal attack, and defeat in detail. Dispersion in depth is preferable to purely lateral formations since it avoids frontages that over-extend the defender, provides a larger percentage of a given force as a reserve, avoids lateral movements in the face of an enemy attack, permits detection and destruction of infiltrators, and provides a better posture from which to launch offensive operations.

g. Maximum Use of Offensive Action. In the defense, every opportunity is taken to wrest the

initiative from the enemy and to destroy him. The defender must be prepared to take offensive action whenever the opportunity presents itself. The counterattack or spoiling attack is often the key to success in the defense. They may achieve results out of proportion to the size forces involved.

h. Integration and Coordination of Defensive Measures. The overall defense plan involves the careful integration and coordination of all defensive measures.

- (1) Fire planning is conducted and coordinated at all levels. Fire planning must provide for continuous fire support to the forces in the security area, forward defense area and striking force/reserve area. Fires are also planned to control gaps and cover barriers.
- (2) When time permits, natural obstacles are supplemented by minefields and other artificial obstacles to form effective barriers. Such barriers are designed to restrict the movement of the enemy without restricting the planned maneuver of our own forces. For a detailed discussion on barrier planning see appendixes XIX and XX.
- (3) Mutual support is provided between units by fire or movement, or both, and coordinated and incorporated into the overall plan of defense.
- (4) All electronic surveillance means are coordinated closely and incorporated into the overall plan of defense (app. XII).

i. Time. Time available for planning and preparation is considered as well as during the conduct of the defense.

224. Basic Types of Defense

There are two basic types of defense, the *mobile* defense and the *area* defense.

a. The mobile defense employs a combination of offensive, defensive, and delaying actions, with the ultimate success of the defense depending upon offensive action. The primary objective of the mobile defense is the destruction of the attacking enemy force. In the mobile defense, minimum forces are deployed as fixing forces in the forward defensive area to detect,

disorganize and delay the attacking enemy and to provide time and space for action of the striking force. The bulk of the combat power of the command is deployed as a counterattack force which employs the principles of offensive combat to destroy the enemy at the most favorable time and place.

b. In the *area* defense emphasis is placed on retention of specific terrain and offensive and defensive actions are directed at stopping the enemy forward of the forward defensive area or ejecting him if he penetrates this area. The bulk of the combat power of the command is committed to defense of the forward defensive area. Reserves are employed to add depth to the defense, to block or destroy enemy penetrations, to counterattack and restore the defensive position, or to reinforce threatened forces.

225. Selection of the Type Defense

a. Selection of the type defense to be used depends on the mission; the nature of the terrain and the degree to which specific terrain must be held; the relative mobility and combat power of opposing forces; the air and nuclear situation; depth of the defensive area; and disposition and planned employment of all friendly forces by higher headquarters.

b. Mobile defense is the preferred type of defense for armor. Its adoption is favored when—

- (1) The mission and the area of operation permit the defense to be organized and fought in sufficient depth.
- (2) Terrain permits relatively free movement by the defending force.

- (3) The mobility of the defending forces compares favorably with that of the enemy.
- (4) The enemy has the capability of employing nuclear weapons and the defender must employ maximum dispersion and mobility to decrease vulnerability to nuclear attack.
- (5) The air situation permits relatively free movement of the defending forces.
- (6) Minimum time is available for deployment of forces and organization of the ground and defensive positions.

c. Area defense is less desirable for armor units because it does not make maximum use of the mobility of the tank. Its adoption is favored when—

- (1) There is a lack of depth in the defensive area.
- (2) There is a requirement to retain specific terrain.
- (3) Terrain restricts maneuver by the defending force.
- (4) The attacker possesses a mobility differential over the defender.
- (5) The attacker possesses air superiority.
- (6) Time is available for the construction of defensive positions to include the preparation of barriers.

226. Factors Affecting Employment

The commander must employ armor in a manner calculated to make maximum use of its favorable characteristics. Regardless of the type defense that may be employed this calculation is based on a reasoned analysis of the factors of METT (pars. 29–33).

Section II. ORGANIZATION OF THE DEFENSE

227. General

In either the mobile or the area defense, armor units may be required to organize the defense of specific terrain in accordance with the overall plan of defense of the higher commander. In mobile defense, a small armor unit may be required to organize a sector of the forward edge of the battle area (FEBA) or one or more blocking positions. In the area defense, the unit may be assigned a sector to defend as part of the forces in the forward defense area.

Techniques in organizing the defense of the ground in these cases are basically the same and are discussed in this section. They include reconnaissance, planning, organization of the ground, command and control, fire planning, surveillance, and employment of supporting troops.

228. Reconnaissance for Defensive Action

Upon receipt of an order to assume the defensive, the commander makes a map study and formulates tentative plans. As soon as pos-

sible, he reconnoiters his assigned sector as completely as time and the situation will permit. While on reconnaissance he determines—

- (1) The probable avenues of enemy armor and dismounted approach.
- (2) The terrain that is to be occupied by security forces.
- (3) Key terrain that is to be retained or the use of which will be denied the enemy.
- (4) Natural obstacles forward of and in the area that can be used to strengthen the defensive area.
- (5) Location of reserves.
- (6) Location of command posts.
- (7) Location of logistical support installations.

229. Planning for Defense

Normally, the defender has an advantage in that he can select the terrain and has time for organization of the ground and opportunity to improve natural obstacles. Initially, the commander develops a tentative plan from his reconnaissance, and issues a warning order. This is followed by more detailed plans, including plans for—

- (1) Organization of the ground.
- (2) Organization for combat.
- (3) Command and control.
- (4) Fire support.
- (5) Security and surveillance.
- (6) Employment of supporting troops.
- (7) Logistics.

230. Priority of Work in Organization of the Ground for Defense

In the defense, measures for increasing the effects of fire and movement take precedence over all other work. The goal is to insure that accurate fire can be delivered on the attacker, to render his fires ineffective, and to impede his movements while facilitating the movement of defending forces. The normal tasks associated with organization of the ground includes—

a. Preparation of Counterattack Routes. A reconnaissance is conducted for each counterattack plan to determine the requirements for improving the route to facilitate the movement of forces. This task also includes the recon-

naissance and improvement of routes from primary to supplementary positions.

b. Preparation of Defensive Position.

- (1) As soon as defensive positions are occupied, units organize the ground for defense. Fields of fire are cleared, tanks are placed in hull defilade, emplacements are dug for crew-served weapons. Foxholes and slit trenches are dug for personnel. Alternate and supplementary positions are planned and prepared as time permits.
- (2) Occasionally armored personnel carriers may be integrated into the forward defense positions. Their vehicular weapons can be assigned fire missions to augment the long range, close-in, and final protective fires of other automatic weapons. However, because of their high silhouette and vulnerability to certain types of enemy fire, it is usually necessary to place the majority of the armored personnel carriers in defilade to the rear, with provision for moving them, as the situation requires, to previously prepared firing positions from which they can augment protective fires. When in defilade, they can provide flank and rear protection.
- (3) Range cards are prepared for all crew-served weapons. All vehicles, weapons, and emplacements are camouflaged. Every effort is made to deceive the enemy as to the true location of the defensive positions. Movement of individuals and vehicles within the defensive areas should be kept to a minimum.

c. Strengthening the Defensive Position. Obstacles are improved and mines are used to provide close-in protection for each blocking position. Protective, defensive, and phony minefields may be installed. Protective minefields may be installed, upon authority of the company commander, to the front and flanks of the blocking positions to provide security. Phony minefields may be used as gaps by the striking force/reserve. Time permitting, and upon authority of the brigade commander, defensive minefields may be installed to add strength to

each blocking position. Each minefield must be marked and recorded properly.

d. Preparation of Routes for Supply and Evacuation. Supply routes are established for each battalion task force. Supply routes must be coordinated with the plan of defense, to insure that they do not conflict with the maneuver of forces conducting the defense; alternate supply routes may be required. Supply routes should be marked and traffic entering the forward defensive area should be controlled.

e. Establishment of Communications System. Emphasis will be placed on warning of enemy approach.

231. Organization for Combat

Organization for combat is the method by which a commander organizes his forces to meet the varying requirements of the battlefield in terms of the factors of METT. These factors are of such importance and sufficiently different in the two basic types of defense that a detailed discussion of each is set forth in paragraphs 237 through 243 (Mobile Defense) and paragraphs 244 through 253 (Area Defense).

232. Command and Control

a. General. The defense commander must insure effective control and coordination of the defensive action; however, such control must permit maximum flexibility of employment of the forces conducting the defense and allow freedom of action by subordinate commanders. The commander initiates control and coordination by announcing his concept of the operation and the plan of defense, by insuring adequate communication, and by employing necessary control measures, together with priorities of effort and sequence of action.

b. Control Measures.

- (1) Objectives are normally established for the coordination of each counterattack plan. In addition, fire control measures, lines of departure, axes of advance, or directions of attack are established for each counterattack plan.
- (2) Phase lines may be used to control the rearward movements of the security force, to delineate areas for surveil-

lance, and to coordinate the movement of the striking force/reserve.

- (3) Boundaries are used to delineate lateral responsibilities in the forward defensive area. Boundaries normally extend forward to the maximum range of organic weapons, and rearward to the depth of the blocking positions.
- (4) Coordinating points are used in the forward defensive area for the coordination of the fires of adjacent units.
- (5) Contact points may be designated to insure coordination of units performing surveillance missions, and of units operating observation posts or combat outposts.

c. Communication. Although radio is the means of communication most often used in armor units, supplemental means should be established to insure effective communication under all conditions.

233. Fire Planning in Defense

a. Mission. The fires of organic and supporting weapons are coordinated to—

- (1) Bring the enemy under effective fire as early as possible.
- (2) Subject the enemy to progressively heavier fire as he approaches the defensive area.
- (3) Destroy the enemy by fire if he attacks the blocking positions.
- (4) Support the counterattack and movement of other units to support the plan of defense.

b. The Plan of Fire Support. The plan of fire support is the coordinated and integrated plan for all fires, nuclear and nonnuclear, organic and supporting, available to the commander at each echelon. Components of the plan of fire support include detailed plans for fires of automatic weapons, tanks, mortars, and all available fire support agencies. Planning for fires is continuous and is as detailed as the situation and the time permit. Fires are planned on all targets and areas on which a need for fire might arise, to permit prompt and effective delivery of fires under all conditions of visibility. Provision must be made to allow de-

partures from the plans to meet unforeseen situations and to permit prompt attack of targets of opportunity.

- (1) Each unit develops plans for employment of its organic weapons. It plans for supporting fires, and includes the request for these supporting fires in the plan of fire support, which it submits to the next higher headquarters. Subordinate plans of fire support are incorporated into the next higher echelon's plan of fire support.

- (2) Planned fires for the defense fall into four categories—long range fires, close defensive fires, final protective fires, and fires within the defensive area.

c. Long Range Fires.

- (1) Long range fires are planned to engage the enemy as early as possible to inflict casualties, to delay his advance, and to disrupt his organization.
- (2) Long range fires are employed initially in support of the security force.
- (3) As the enemy continues his advance and comes within range of additional weapons, he is brought under an increasingly heavy volume of fire.
- (4) Long range fires should also support counterattacks and spoiling attacks conducted forward of the defended area.

d. Close Defensive Fires. Close defensive fires are planned to disorganize the attacking force before the enemy can assault a blocking position by inflicting the greatest possible number of casualties; by disrupting command, control, and communication; by denying observation; and by neutralizing his supporting fires. Close defensive fires also support counterattacks or spoiling attacks made immediately forward of the battle area.

e. Final Protective Fires. Final protective fires are designed to break up the enemy assault on the forward defended positions under all conditions of visibility. Such fires consist of a first priority, prearranged, barrier of fire laid down just in front of forward blocking positions and strongpoints consisting of mortar and artillery barrages and final protective line fires

of machineguns. Tanks in the blocking position engage targets of opportunity.

f. Fires Within the Forward Defensive Area. Fires within the position are planned to limit possible penetrations of the forward defensive areas or support counterattacks. Fires are planned to seal off the penetrating force and to prevent movement of enemy reinforcements. Plans should be made for fires of adjacent units to support the penetrated units by firing on the flanks and rear of the penetration force. In addition, fires should be planned to cover gaps between blocking positions.

g. Air Support. If available, close air support is integrated into the plan of fire support. If possible, ground alert or air alert aircraft should engage targets of opportunity. Preplanned on-call missions should be planned on locations where enemy troop concentrations are likely to occur during an enemy attack. Preplanned missions should be requested to support counterattack plans.

h. Additional Information. See paragraphs 274 through 278 and appendix XIV for additional information on fire support planning.

234. Security and Surveillance in Defense

Gaps throughout the defensive area must be secured against infiltration, guerrilla action, or airborne and airmobile attacks. The commander plans for the employment of all available means in providing adequate surveillance of the defensive area (app. XXII).

235. Combat Support Units in Defense

a. Artillery.

- (1) The massed fires of supporting artillery are essential to the success of the defense. Every effort is made to meet enemy attacks with massed artillery fires. If the frontage is so extensive that artillery fires cannot be massed across the entire front, plans must be developed for concentrating fires on likely avenues of enemy approach and on areas to be denied to the enemy.
- (2) Light artillery normally is placed in direct support of each brigade conducting the defense. Artillery liaison officers are provided to each battalion

of the brigade, with forward observers being provided to each company-size combat unit.

- (3) Fires of general support artillery may be made available by request through direct support artillery channels.
- (4) Artillery elements are attached normally to the security force during the initial conduct of the defense. When the security force is forced to withdraw, the artillery withdraws to pre-selected positions to support the defensive action.

b. Engineers. Engineer support during defensive operations is discussed in paragraph 284.

c. Army Aviation. Army aviation is used to augment the ground reconnaissance and security effort. Initially, maximum air support is provided to the security force. After the security force has withdrawn through the forward defensive area, air vehicles may provide surveillance of the flanks and the areas between strongpoints. They may assist the movement of forces in the defensive area and deliver critical items of supply.

236. Defensive Echelons

Defensive echelons include the security echelon, the forward defensive echelon and the reserve echelons. Each of these echelons is allocated forces and fires as part of the overall plan of defense (Mobile Defense pars. 237-243 and Area Defense pars. 244-253).

Section III. MOBILE DEFENSE

237. General

a. The mobile defense employs a combination of offensive, defensive, and delaying actions, with the ultimate success of the defense depending upon the offensive action of the striking force. The primary objective of the mobile defense is the destruction of the attacking enemy force.

b. Although armor units on independent missions, or subordinate units of the armored division, may employ some of the techniques of the mobile defense, the division is normally the smallest unit to conduct such an operation. Armor units participate normally in a mobile defense as the security force, the fixing force, or the reserve.

other supporting fires, including nuclear weapons when authorized, and ground action.

- (2) The size and composition of the covering force depends upon the front to be covered and the amount of delay required. The covering force for a division may be a brigade, the armored cavalry squadron, or a battalion task force. In some situations, the armored cavalry regiment may be attached from corps to perform this mission. The covering force is reinforced normally with combat and combat support units necessary to accomplish the mission (pars. 92-110).
- (3) When the armored division is executing the mobile defense as a part of the corps, the covering force will coordinate its actions with the security forces of adjacent divisions.
- (4) When the armored division executes the mobile defense independently, the covering force may be located from 8 to 25 kilometers forward of the FEBA.
- (5) When engaged heavily with the enemy and the plan of defense does not permit establishment of the forward defensive echelon further to the rear, it

238. The Security Forces

a. General. Security forces consist of the covering force, observation posts, listening posts, patrols, and rear area security forces.

b. Covering Force.

- (1) The covering force detects and reports the approach of the enemy; delays and disorganizes his advance; and deceives him as to the location of the main force. The division covering force seeks to destroy the enemy within its capabilities employing

will not be possible to employ a covering force.

c. Observation Posts and Listening Posts. In the mobile defense sizable gaps will often exist between elements of the fixing forces. Observation/listening posts are established forward of, between, and to the rear of blocking positions. Observation posts provide early warnings of the enemy approach and adjust long range supporting fires on the enemy. They are located on dominant terrain generally from 800 to 2,000 meters forward of the FEBA. Troops required to man the observation posts are provided from the fixing forces. The location of observation posts is coordinated by the brigade commander with adjacent units and must insure complete surveillance of the defensive area. Listening posts are employed during darkness and other periods of reduced visibility. Communication must be provided each observation post/listening post to permit accomplishment of their mission.

d. Patrols. Foot and motorized patrols are employed between blocking positions and observation posts to prevent or detect infiltration and to maintain surveillance over assigned areas. Patrols may be used at night to check listening posts, to maintain liaison with adjacent units, to seize PW's, and to gain information of the enemy.

e. Rear Area Security. The increased dispersion required by nuclear warfare, together with the enemy's capability of employing airborne, airmobile, and guerrilla forces in rear areas, requires that all elements be trained to provide their own local security. Combat units may be provided to assist in rear area security. The armored cavalry squadron may be assigned such missions.

239. Fixing Forces

a. General. Fixing forces, consisting of minimum forces and heavy in mechanized infantry, are employed in the forward defensive area. The mission and the area to be defended should be stated with minimum restrictions to permit fixing forces commanders to use their means to maximum advantage within the framework of the overall plan of defense. The holding of specific terrain by the fixing force

may restrict the execution of the mobile defense. However, fixing forces may be required to hold terrain on the flanks of other defending units that are conducting an area defense.

b. Mission. Missions suitable for units assigned to fixing forces are—

- (1) Warn of impending attack and provide information on the progress of the attack.
- (2) Defend.
- (3) Delay, deceive, and disorganize the attacker.
- (4) Canalize the attacker into an area suitable for attack by the reserve or by nuclear fires.
- (5) Force the attacker to mass.

c. Actions of the Fixing Forces. Fixing forces accomplish the mission assigned by a combination of the following actions:

- (1) Establishment of observation or listening posts and other surveillance means.
- (2) Patrolling.
- (3) Occupation and defense of blocking positions.
- (4) Delaying action.
- (5) Offensive action within their capabilities.

240. The Reserve

a. General. The reserve is the decisive element in the mobile defense. It consists of the bulk of the combat power of the command and is strong in tanks.

b. Mission. The reserve destroys the enemy by offensive action.

c. Actions of the Reserve. The reserve accomplishes its mission by attacking within, to the flanks, or forward of the FEBA.

241. Considerations of the Mobile Defense

a. Organization of the Ground. Organization of the ground consists of use and optimum improvement of the natural defensive features of the terrain with the men, materials, and time available.

- (1) The specific location of the units in the defensive echelons is determined from the following:

- (a) Unit missions to be assigned and the maneuver room required to execute them.
- (b) Enemy capabilities, known and assumed.
- (c) Military characteristics of the terrain, particularly the defensive strength of obstacles, all possible enemy avenues of approach, and the area trafficability.
- (d) The capabilities of friendly forces, including all available combat support units. In this connection, the relative mobility of all units and their responsiveness in the fluid battle brought about by the adoption of the mobile defense has considerable bearing on the positioning of those units.

b. Organization for Combat.

(1) Security forces.

- (a) The covering force is organized as a highly mobile, self-contained force in keeping with the fundamentals of security discussed in chapter 5.
- (b) The observation and listening posts established by the fixing forces are coordinated by the brigade commanders. Artillery or mortar observers are employed with those elements that provide the best observation of the area.

(2) Fixing forces.

- (a) Brigades in the fixing force receive the attachment of combat maneuver battalions in the number and type best suited for the accomplishment of the mission. Such brigades will normally be mechanized infantry heavy. The reserve of the brigade, if established, is normally tank heavy.
- (b) Battalion task forces and company teams are organized in accordance with an analysis of the factors of METT. The anticipated mission of the task force or team is a major consideration in determining the size and composition of the force. Normally, task forces in the fixing

forces will not have sufficient forces to withhold a reserve.

- (3) *Reserves.* The reserve is organized with as much combat power as possible, is tank heavy for maximum offensive power, and is employed under a single commander.

242. Planning for the Mobile Defense

a. Covering Force. The plan for the covering force is prepared as outlined in chapter 5.

b. Fixing Forces. The plan for the fixing forces makes the most effective use of the forces available to develop the situation. Commanders at all levels express clearly their intentions to their subordinates.

- (1) *Brigade.* Based on the division order, brigade commanders assign defensive sectors to battalion task forces considering the forces available and the enemy avenues of approach into the brigade sector. Boundaries, coordinating points, and the general trace of the FEBA are designated according to the definitions and purposes outlined in appendix VII. Based on an analysis of key terrain, certain blocking positions may be designated by brigades in the fixing forces, including positions in the task force sectors. If an analysis of the situation indicates, a small, tank-heavy reserve may be held at brigade level. Normally, elements of the fixing forces are initially deployed in their blocking positions or strongpoints. However, when the brigade commander determines that his forces should initially be disposed in assembly areas, he designates the appropriate assembly areas and issues warning orders for the occupation of the defended localities (FM 17-30).

- (2) *Battalion.* Battalion task force commanders normally assign sectors to company teams based on the brigade order, the forces available, and the enemy avenues of approach into the battalion task force sector. Boundaries, coordinating points, and further

refinements of the trace of the FEBA are designated. See appendix X for a discussion of appropriate control measures. Battalion task forces rarely hold a reserve.

- (a) Based on an analysis of terrain the battalion task force commander may designate a specific terrain feature as a blocking position. He must specify when or under what circumstances the position(s) is to be occupied and the priority.
- (b) When the battalion task force commander determines that his forces should be disposed initially in assembly areas, rather than in defended localities, he designates the appropriate assembly areas and issues warning orders for the occupation of the positions.
- (c) When the battalion task force commander determines that he will conduct a delaying action or offensive action he employs the techniques outlined in chapters 9 and 7 respectively. Combinations of these actions may be used. Such combinations add to the complexity of the plan and must be expressed clearly to subordinates.
- (3) *Company.* Company team commanders assign positions and sectors of fire to platoons based on the task force order, forces available, and enemy avenues of approach into the company team zone. The company team does not hold a reserve.
 - (a) Blocking positions are organized in accordance with paragraph 261 and FM 17-15.
 - (b) A delaying action is planned in accordance with the techniques outlined in chapter 9 and FM 17-15.
 - (c) Offensive action is planned in accordance with the techniques considered in chapter 7 and FM 17-15.

c. Counterattack Planning.

- (1) Counterattack plans are prepared, as a minimum, to attack an assumed major penetration on each principal

enemy avenue of approach into the division area. First priority for planning is the assumed penetrations, which if executed would have the most effect on the mission of the force conducting the mobile defense. Planning priorities may shift as intelligence of the enemy develops.

- (a) Counterattack plans permit, to the extent possible, the reduction of the time required to commit the reserve if the penetration develops as envisioned, and to assign priorities for reconnaissance, engineer efforts, and coordination. If the enemy penetration does not conform to the assumed penetrations, modification can be made without excessive loss of time.
- (b) Assumed penetrations will normally conform only generally to actual enemy actions. Although useful for planning, assumed penetrations are not to be construed as preselected areas into which the enemy must be canalized before being attacked by the reserve or nuclear fires.
- (2) When disseminated to the commander of the reserve, the division counterattack plans will include—
 - (a) Assumptions of the status and location of both friendly and enemy forces.
 - (b) Control measures.
 - (c) Organization for combat.
 - (d) Missions for brigades and other units subordinate to the division.
 - (e) Plans of fire support.
- (3) Based on the division counterattack plan, the commander of the reserve prepares and disseminates detailed plans to subordinates. The sequence of work is in accordance with the priority established by the commander conducting the mobile defense. Depending upon the time available, detailed reconnaissance is accomplished by all commanders, and rehearsals are conducted. Fire plans are prepared to support each counterattack plan.

- (4) Counterattack plans employ the principles of the offense (ch. 7) and are designed to strike the enemy forward of, within, or in the rear of the forward defensive area.
- (5) Counterattack plans must be flexible to meet the actual situation. The actual counterattack will probably be a variation of one of the counterattack plans. Particular consideration must be given to multiple penetrations to avoid piecemeal commitment of the reserve (also see FM 17-30).

243. Conduct of the Mobile Defense

a. The mobile defense is conducted as a resilient opposition to the enemy attack by minimum forces that, within their capabilities, gain information, delay, disorganize, divert, and otherwise weaken the attack in preparation for a counterattack by the bulk of the command to destroy the enemy.

b. Unless surprise offers a great opportunity for success, the enemy is taken under fire as early as possible. As the enemy advances, he is taken under fire by the security forces who warn, deceive, and execute maximum delay, within their capabilities, without becoming engaged decisively. They attempt to inflict maximum casualties on the advancing enemy and force him to deploy. As a means of collecting information, elements of the security force may remain in the area after passage of the enemy.

c. The attacker's strength and dispositions during the engagement with the security forces may favor action by the reserve forward of the FEBA to destroy him. The commander must weigh carefully the risks in terms of their effects on the accomplishment of the mission.

d. A spoiling attack or a tank sweep to disrupt the enemy attack during its formative stages should be considered. The decision to commit such a force must be carefully considered against the possible piecemeal loss of the strength of the command to the detriment of the overall mission.

e. As the security forces withdraw through the fixing forces, the attacker is taken under fire by all weapons within effective range. The

fixing forces accomplish their mission by a combination of holding ground and a delaying action extending over considerable depth. As the attack develops, commanders are able to judge the *degree* to which specific terrain features must be held. Forces and fires not affected by the attack may be shifted to concentrate against the enemy. Forces may occupy blocking positions in company team to battalion task force strength to force the enemy to mass or become canalized. Normally these positions are held only long enough to contribute to the overall plan. When required, elements of the fixing forces may be given the mission of occupying strongpoints to be defended at all costs. This action should be taken only when specific terrain must be held to permit success of the overall plan of defense. Forces in the fixing force may be employed in limited offensive action when opportunities occur to inflict damage on the enemy.

f. The decision as to when and where to launch the counterattack by the reserve is made by the commander of the overall defense (normally the division or higher commander). It may be advantageous to launch the counterattack when the enemy attack has been slowed, stopped, or disorganized. However, these are not essential prerequisites for the counterattack. Criteria for determining where and when the counterattack should be launched are primarily those for assessing offensive maneuver. For considerations on the launching of the counterattack see FM 61-100.

g. The reserve is committed normally as a unit to destroy the enemy. The counterattack plan may include terrain objectives for control purposes, but the goal of the reserve is destruction of the enemy, not seizure of terrain to restore the position. The reserve seeks to employ the principles of the offense to destroy enemy units, reserves, command facilities, fire support elements, and combat services support. Many techniques of the meeting engagement (pars. 209-211) are used to seize the initiative from the enemy.

h. In the event of multiple enemy penetrations, they may be dealt with simultaneously or individually in the order of the seriousness of their threat. The reserve may be committed to destroy the major threat, while sufficient force

is applied to contain the other threats. It may be necessary to detach part of the reserve and attach it to the fixing force to assist in con-

taining secondary threats. Simultaneous counterattacks by elements of the reserve divide combat power and should be avoided.

Section IV. AREA DEFENSE

244. General

a. The area defense requires the retention of terrain for a period of time. In this type of defense, forward positions are strongly held and emphasis is placed on stopping the enemy forward of the FEBA. The bulk of the combat power is committed to this task. It may not be possible or advisable to physically occupy all key terrain in the defended area, but sufficient combat power must be available to dominate the area. If the enemy penetrates the defense he is destroyed or ejected by counterattack of the reserves with the principal objective of regaining control of the forward defense area. Reserves are also employed to block enemy advances and to reinforce threatened areas.

b. Although armor units normally prefer to employ the techniques of the mobile defense for defensive operations, they may establish an area defense when the terrain or the mission require it.

245. Distribution of Forces in the Area Defense

In the area defense, forces are distributed to accomplish three functions—to provide security and prevent surprise attacks; to stop and repel the enemy's attack; and to destroy or eject penetrations of the forward defensive area. To accomplish these functions, three tactical groupings are organized—the security force, forces in the forward defense area, and the reserve.

246. Selection of the Forward Defensive Area and Reserve Positions

a. The Forward Defense Area. Higher headquarters will normally designate the forward edge of the battle area (FEBA) by establishing boundaries and coordinating points.

b. The Reserve Position. The reserve should be located where it can best execute prepared plans for its employment, considering the probable direction of the enemy's main effort, ter-

rain, route of communication, concealment, and security. The characteristics of a good reserve position include—

- (1) *Accessibility.* It should have good routes for rapid movement to the anticipated sectors of employment.
- (2) *Concealment.* It should not be under enemy ground observation, and should offer the best possible concealment from air observation.
- (3) *Dispersion.* It must permit dispersion of units and vehicles.
- (4) *Firm standing.* It must offer standing that permits free movement of all vehicles in the reserve force.

247. Organization and Function of the Security Force

The size and composition of the security forces depend upon the time required for the defending forces to prepare defensive positions, the terrain, and the troops available.

248. Organization and Functions of Forces in the Forward Defense Area

The commander selects the terrain that must be held to accomplish the defense mission and determines the enemy avenues of approach leading to them. Based on this, he then designates defensive sectors to subordinate units, assuming where possible, that responsibility for avenues of approach or key terrain features is not divided. Boundaries and coordinating points are established between battalion task forces and company teams. Boundaries are extended forward of the FEBA to the limit of the range of supporting weapons, and to the rear to include the subordinate reserve location. The gaps between defensive areas are covered by fire and movement, obstacles, and surveillance. Fires are coordinated between adjacent units. For a discussion of the armored brigade, tank battalion and tank company, see FM 17-30 and FM 17-15.

249. Organization and Functions of the Reserve

Normally, armor units of battalion task force and smaller do not designate a reserve. However, armor units may be designated as an element of either a division or brigade reserve. The reserve is constituted from forces not required in the forward defense area. The reserve is located to protect key terrain and is positioned to block penetrations from both the front and the flanks. Counterattack plans are developed for possible penetrations by the enemy; in addition, counterattack plans are developed to strike the enemy in front of the FEBA or to the flanks. Objectives, routes, lines of departure, and direction of attack are selected for each counterattack plan. Key personnel should reconnoiter the route for each counterattack plan. The reserve plans to reinforce or cover the withdrawal of frontline units. The reserve should be heavy in tanks; however, the exact composition of the reserve is determined after a study of the factors of METT. For a discussion of the armored brigade, tank battalion and tank company, see FM 17-30 and FM 17-15.

250. Conduct of Area Defense

The success of the area defense depends upon the solidity of the defense, maximum application of firepower in front of the FEBA, and timely execution of counterattacks to destroy or eject enemy penetrations. The commander conducts the defense aggressively. He maintains continuous surveillance, using air vehicles and other agencies to locate enemy formations and attack positions and to adjust supporting fires. Once contact has been established, he makes every effort to obtain detailed and timely information about the enemy. The defense progressively disrupts and weakens the enemy from the time he comes within long range fires of the security forces. Emphasis is placed on blocking avenues of approach at the FEBA. Forward defensive forces exert every effort to halt the enemy. However, if the enemy penetrates the area, forward defensive forces attempt to force him into areas favorable for counterattack. When launched, counterattacks are aimed at eliminating the pene-

tration and restoring the integrity of the battle area. The situation may require that certain ground be held regardless of the cost or risk involved; therefore, a commander cannot withdraw from a defensive position without approval of his higher commander.

251. Actions of Security Forces in Area Defense

The security force accomplishes its mission in the same manner as discussed in paragraph 238. The security force maintains contact with the enemy until it withdraws through the FEBA (FM 17-30 and FM 17-15).

252. Actions of Forces in the Forward Defensive Echelon

Forces in the forward defense area engage the enemy at maximum effective range of their weapons. Initially, long range fires are delivered on the enemy; as he continues to advance within range of other weapons, the volume of fires is increased. If the attack is not disrupted by the close defensive fires and the enemy prepares to assault the position, final protective fires are delivered. Adjacent units may be moved to positions from which they can deliver additional fires upon the flanks of the enemy.

253. Actions of the Reserve in the Area Defense

a. If the enemy penetrates the forward defense area, the commander uses his reserve or other forces to limit the penetration. Once the penetration has been slowed or stopped, the commander launches a counterattack to destroy forces in the area and to restore the FEBA.

b. All available combat and combat support forces are used to support the counterattacks. Plans must be sufficiently flexible to permit the counterattacking forces of frontline battalion task forces to participate in the counterattack.

c. Once the enemy force has been destroyed or ejected, the reserve may return to its original positions or may occupy and defend the regained ground.

d. The reserve may be used to conduct

limited-objective attacks to the front of the FEBA to destroy or disrupt the enemy as he forms for the attack.

e. The reserve may be used to reinforce a unit in the forward defense area.

f. If a strong enemy attack penetrates the battle area and counterattacks are unsuccessful, the reserve may be used to block the penetration or to cover the withdrawal of forces from the forward defense area.

CHAPTER 9

RETROGRADE OPERATIONS

Section I. GENERAL

254. General

A retrograde operation is a movement to the rear or away from the enemy. Retrograde operations plans are conducted only with the approval of the next higher commander.

255. Types of Retrograde Operations

a. Delaying Action. A delaying action is a retrograde operation in which maximum delay and damage are inflicted on an advancing enemy without the delaying force becoming decisively engaged or outflanked. In executing a delaying action, minimum space is traded for maximum time.

b. Withdrawal. A withdrawal is a retro-

grade operation in which all or part of a deployed force disengages from the enemy. It may be executed during daylight or under cover of darkness and may be forced or voluntary. Regardless of the type of withdrawal being conducted, contact is maintained with the enemy forces to provide security and deception.

c. Retirement. A retirement is a retrograde operation in which a force not in contact marches away from the enemy to avoid combat under existing conditions. It may be made following a withdrawal. Normally, a retirement is performed to allow future combat operations to be conducted under more favorable conditions or in a more decisive place or at a more decisive time.

Section II. CONSIDERATIONS OF THE RETROGRADE

256. General

Armor units are capable of inflicting heavy damage to enemy units during retrograde operations, particularly in the delaying action. Under these conditions, success depends upon planning and conducting operations so as to capitalize on the capabilities of the unit. The following are considerations that affect the employment of armor units in the retrograde.

257. Weather and Terrain

a. Weather and terrain have a major influence on the planning and conduct of retrograde actions. Clear weather provides good observation and assists in attaining maximum results from fires. Unfavorable weather conditions may limit observation, reduce the effects of nuclear weapons, limit cross-country movement, and increase the problem of control.

b. Terrain is selected that provides long range observation and fields of fire; conceal-

ment and protection from enemy observation. This allows the commander to engage the enemy at maximum effective range and to maintain this fire as the enemy maneuvers toward the position.

c. Obstacles are used extensively to impede the advance of enemy units, to protect exposed flanks, and to force the enemy to mass. Mines and demolitions aid in slowing and canalizing the enemy advance. Nuclear weapons, as well as other fires are employed to destroy the enemy when he attempts to breach or bypass the obstacle.

d. Good road nets and trafficable terrain facilitate the movement of units and the commitment of counterattacking forces. Terrain affording good cross-country trafficability permits wide dispersion and thus reduces vulnerability to enemy air and nuclear attack.

e. Effective use of existing cover and concealment assists armor units in destroying the

enemy by achieving surprise, and reducing the enemy's ability to locate friendly forces.

258. Control and Coordination

a. Armor units conducting retrograde operations will be deployed frequently on an extended front. Subordinate units may be dispersed widely, especially during rearward displacements. Retrograde operations normally consist of decentralized actions within the framework of the overall detailed plan. Effective control and coordination of such operations require centralized planning and control and decentralized execution. Subordinate commanders must be aware of the overall concept of operation to insure effective and intelligent execution.

b. Radio communication is used at all echelons to exercise control and coordination. It may be used by security forces to simulate normal traffic during a retirement or withdrawal operation.

c. Control of units in contact as to displacement to the rear is exercised primarily by establishing boundaries between units. Boundaries are not used between platoons except in armored cavalry actions. For units not in contact, routes of withdrawal are designated together with time of movement. Phase lines, checkpoints, and other control measures appropriate to tactical marches for coordinating and controlling movement may be used. When units must share routes, road priorities are assigned.

d. Civilian control policies must be simple to execute, easily understood, and capable of enforcement with minimum employment of tactical troops. Refugees must not be permitted to interfere with military operations.

259. Security and Deception

a. Employment of nuclear weapons, coupled with limited offensive action, assists in providing security during retrograde operations. Knowledge of the intent to execute a withdrawal or to displace is denied the enemy as long as possible. Maximum passive security and deception measures are adopted to deprive the enemy of knowledge of the move. These measures may include radio listening silence for units displacing; maintenance of a normal radio pattern in the forward area; maintenance

of normal artillery and other supporting fires; displacement of units under cover of darkness or under conditions of reduced visibility; and retention of sufficient troops in position to indicate the presence of the entire force.

b. Security against nuclear attack is provided by executing operations on a broad front, and denial to the enemy of observation and information.

c. Positive measures must be taken to provide security to the front, flanks of forces. Security detachments are employed to hold defiles that must be traversed during the operation. Security measures must be effective against both air and ground attack.

d. Deception measures are employed to assist in withdrawing with minimum enemy interference.

260. Combat Support

a. Air Support.

- (1) Tactical Air Force aircraft are employed against hostile aircraft and to delay the enemy advance by harassing and interdicting hostile ground forces at critical localities. Maximum use is made of Tactical Air Force offensive aircraft to support offensive ground actions.
- (2) Army air vehicles are employed in reconnaissance and to assist the commander in the execution of his plan. Aviation units can be used in shifting troops rapidly, in supplying units, and in evacuation.

b. Artillery.

- (1) Artillery is employed in retrograde operations to take the enemy under fire at extreme ranges, to interdict enemy avenues of approach, deliver harassing fires, destroy enemy concentrations, and provide continuous close support of maneuver units.
- (2) Retrograde operations conducted on a wide front will often dictate the attachment of artillery units to committed brigades.

c. Engineer.

- (1) The requirements for engineers by units in contact with the enemy may dictate attachment of engineers to them.
- (2) Engineers provide advice and assistance in the formulation and implementation of obstacles which are used to delay the enemy or to canalize him into areas where he can be destroyed with fires. Obstacles must be coordinated with higher headquarters to prevent interference with future operations.
- (3) Under most favorable conditions, subsurface or surface nuclear detonations may be employed to create craters and contaminated areas that will slow or impede the enemy's advance. The employment of such ADM must be authorized by the higher commander (app. XII).
- (4) Detailed plans are prepared for the use of demolitions along enemy avenues of approach. Demolitions are placed in defiles and on routes traversing natural and artificial obstacles. Demolition plans include—
 - (a) Provisions for placing and firing the necessary demolitions.
 - (b) Adequate guards to prevent premature firing of charges or seizure by enemy infiltrators.

- (c) Fixed responsibility for the destruction of bridges.
- (d) Schedule for the destruction of bridges when no longer needed by friendly forces.
- (e) Covering by fire those obstacles that are created by demolition.

- (5) The destruction of bridges is of major importance to the retrograde force commander. Care must be exercised to insure that bridges are not blown prematurely or that they are not seized intact by the enemy. Responsibility for blowing bridges in a zone is delegated to the tactical commander. A demolitions firing party and a demolition guard are designated for each bridge. The guard commander has the authority to destroy the bridge, subject to conditions established by the higher commander. A list of all units that are to use the bridge is furnished the guard commander. Each unit commander notifies the guard commander when his unit has cleared. After the main body has crossed, the majority of the bridges in the zone are destroyed. Certain predesignated bridges are left for use by security elements. When capture of the bridge is imminent, the demolition guard commander will destroy it even though all security elements have not crossed.

Section III. DELAYING ACTION

261. General

a. A successful delaying action gains maximum time while surrendering minimum space without the delaying force becoming engaged decisively or outflanked.

b. A unit withdraws from one location to another only with specific authority of the next higher headquarters.

c. A unit is decisively engaged when it loses freedom of action with regard to the accomplishment of its mission and no longer has or can apply with effect the resources available to

influence the situation to regain freedom of action. Examples of a unit being engaged decisively are—

- (1) When under assault by enemy forces of such magnitude that enemy success is insured.
- (2) When the enemy can place such effective fire on friendly unit's position and routes of withdrawal as to make them untenable.
- (3) When enemy fires are such that dismounted troops cannot leave positions to mount their vehicles.

d. A unit is outflanked when enemy forces with a capability of adversely affecting the mission of the delaying force are on the flank or in the rear of the delaying force.

e. Offensive action is taken whenever opportunities arise to inflict serious damage on the enemy; disengage a unit decisively engaged; seize dominating terrain; or deceive the enemy.

f. Delaying actions are accomplished by—

- (1) *Delay on successive positions.* In the delay on successive positions, the initial delaying position is organized and occupied by the unit. When withdrawal becomes necessary, the unit displaces to the next rearward delaying position providing certain elements to remain in contact with the enemy. This procedure is repeated through successive delay positions. Because wide frontages are common in the delay, armor units will normally delay on successive positions.
- (2) *Delay on alternate positions.* The force is divided into two elements. The first element occupies the initial delaying position while the second element occupies and improves the next rearward delay position. When the first element is forced to withdraw, it displaces through or around the second element and moves to occupy and improve the subsequent delay position to the rear. Before displacing, the first element provides certain forces to remain in contact with the enemy. As the enemy continues to advance, the second element repeats the procedure used by the first element. Armor units will seldom operate on a front narrow enough to permit delay on alternate positions.

Note. A combination of (1) and (2) above may be employed.

g. Regardless of how the delay is accomplished, continuous delay is inherent in each delay action. Continuous delay is achieved by maintaining constant contact with the enemy with at least a portion of the delaying force during the entire delay period. Normally, armor units will use all available forces to inflict

maximum damage upon the enemy as he attempts to close on the delay position.

262. Planning

a. *General.* Planning the delaying action is centralized but execution is decentralized. Orders to armor units will state the mission normally in general terms and specify, as a minimum, the following:

- (1) *The general location of the initial delaying position (IDP).* This general location is refined at each level of command until, finally, positions are selected for men, weapons, and combat vehicles. If the unit is in contact when the order to initiate the delay is received, the present friendly positions may become the IDP.
- (2) *Area for delay.* The area assigned to each unit down to company team level is indicated by lateral boundaries. Company team commanders normally assign areas to their platoons by orientation on the ground.
- (3) *Period of delay.* Commanders guide their subordinate's planning by announcing the time the enemy is to be held forward of a specified line. The primary purpose of this measure is to assist coordinated action among adjacent forces and establish a planned time phasing of the operation. The stated time does not imply authority for withdrawal or displacement. The delaying force holds the enemy forward of designated areas for the longest time possible.
- (4) *Contemplated future action.* Any future plans, such as a withdrawal through or around a rearward position, must be announced if they affect the planning of subordinates.
- (5) *Limitations imposed upon the operation.* If the commander visualizes any conditions that might limit the planning of his subordinates, he must announce the limitations. For example, the unrestricted demolition of bridges might interfere with subsequent offensive plans.

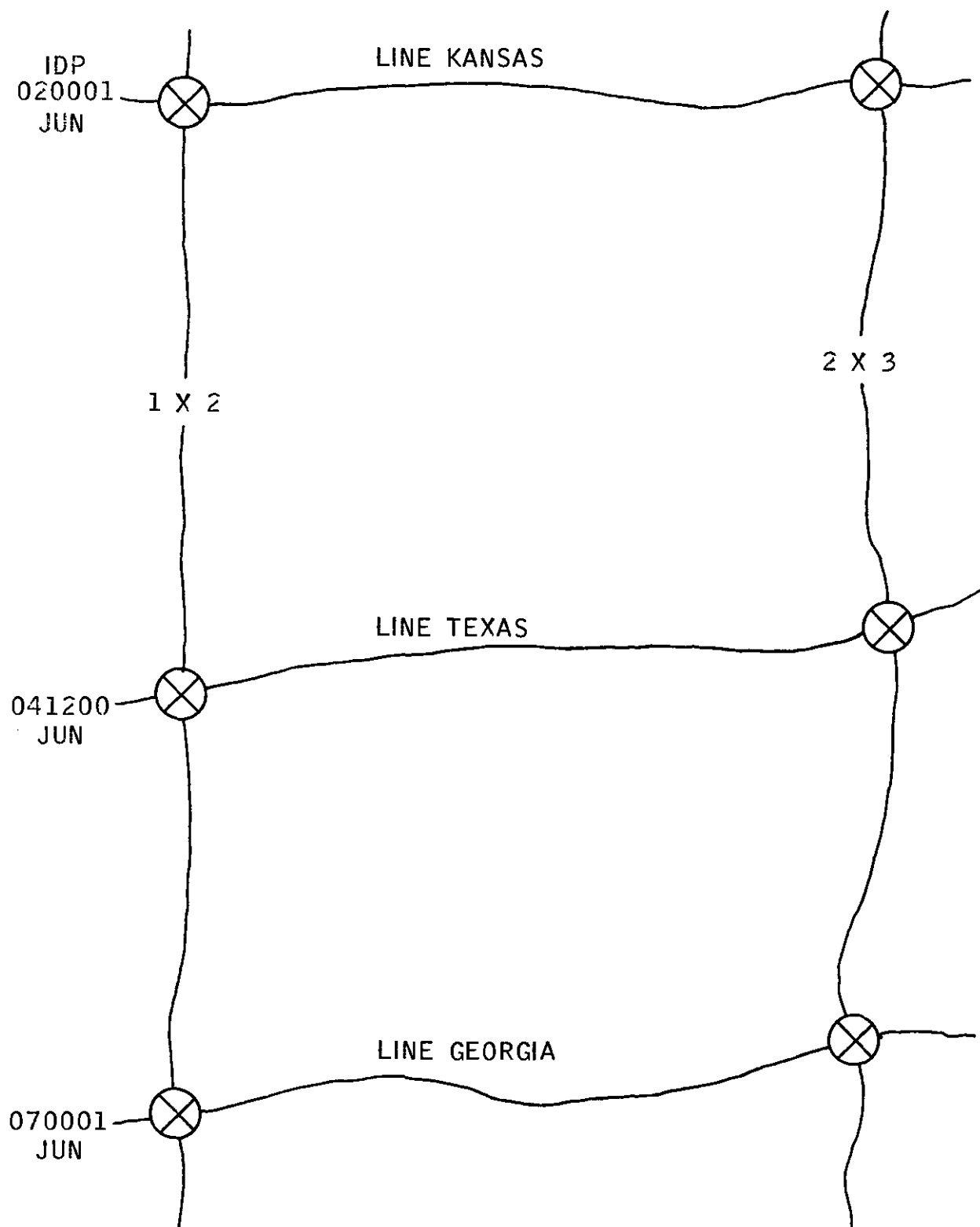


Figure 20. Initial and subsequent delaying positions depicted on division order.

b. Selection of Proposed Delaying Positions.

- (1) Proposed delaying positions are selected that will afford the greatest opportunity for inflicting maximum damage to the advancing enemy as well as insuring continuous delay. Proposed positions are selected where minimum forces can, whenever possible—
 - (a) Stop or repel the attack of enemy security forces so as to force the enemy main body to deploy, develop the situation, and attack.
 - (b) Cause the enemy main body to mass and thus present a profitable nuclear target.
- (2) Terrain offering advantages to the delaying force incorporates the following characteristics—
 - (a) A series of parallel ridges perpendicular to the lines of hostile advance.
 - (b) Obstacles to the front and flanks.
 - (c) High ground with good observation and long range fields of fire.
 - (d) Concealed routes of displacement.
 - (e) An area of road net providing good trafficability.
- (3) Phase lines, checkpoints, and contact points may be used to coordinate actions in the delay. Commanders may use phase lines and a stated time to express their concept of the time-phasing of the delaying action. These phase lines may later be designated as delaying positions.
- (4) Delaying positions are determined in the following sequence—
 - (a) Based on division order (fig. 20), the brigade commander may select additional delay positions as part of the brigade scheme of maneuver (fig. 21).
 - (b) The battalion task force commander, in developing his scheme of maneuver, also may select additional delay positions (fig. 22).
 - (c) The company team commander, guided by the delay positions directed in the battalion task force order, selects terrain to be used in

the delaying action. These terrain features will be organized as blocking positions on and between delay positions to control avenues of enemy approach. Blocking positions in the vicinity of the IDP are occupied while others, in depth, may be reconnoitered and prepared as time permits (fig. 23).

c. Organization of Ground.

- (1) Zones are assigned to units down through company level (platoon level in armored cavalry operations, see app. X).
- (2) Natural obstacles are improved and artificial obstacles are built within the materials, time, and manpower available. Obstacles alone must not be relied upon to halt the enemy's progress.
- (3) Blocking positions are organized in the delay similarly to those used in defense.

d. Disposition of Forces, Delaying Action. Forces in the delaying action are disposed in three echelons: security forces, delaying forces, and reserves.

- (1) *Security forces.* A covering force or other security forces may be employed forward of the IDP when the situation permits. The highest headquarters conducting the delaying action prescribes the force to execute the security mission.
- (2) *Delaying forces.* The bulk of the unit's combat power is normally in the delaying force.
 - (a) Maximum firepower is forward with the bulk of the forces concentrated on likely avenues of approach.
 - (b) The delaying force is deployed in width with little depth.
- (3) *Reserves.*
 - (a) The brigade is normally the lowest level that designates a reserve.
 - (b) In delay on alternate positions, elements not in contact perform the functions of a reserve.

e. Organization for Combat. Forces are organized for combat based on an analysis of METT.

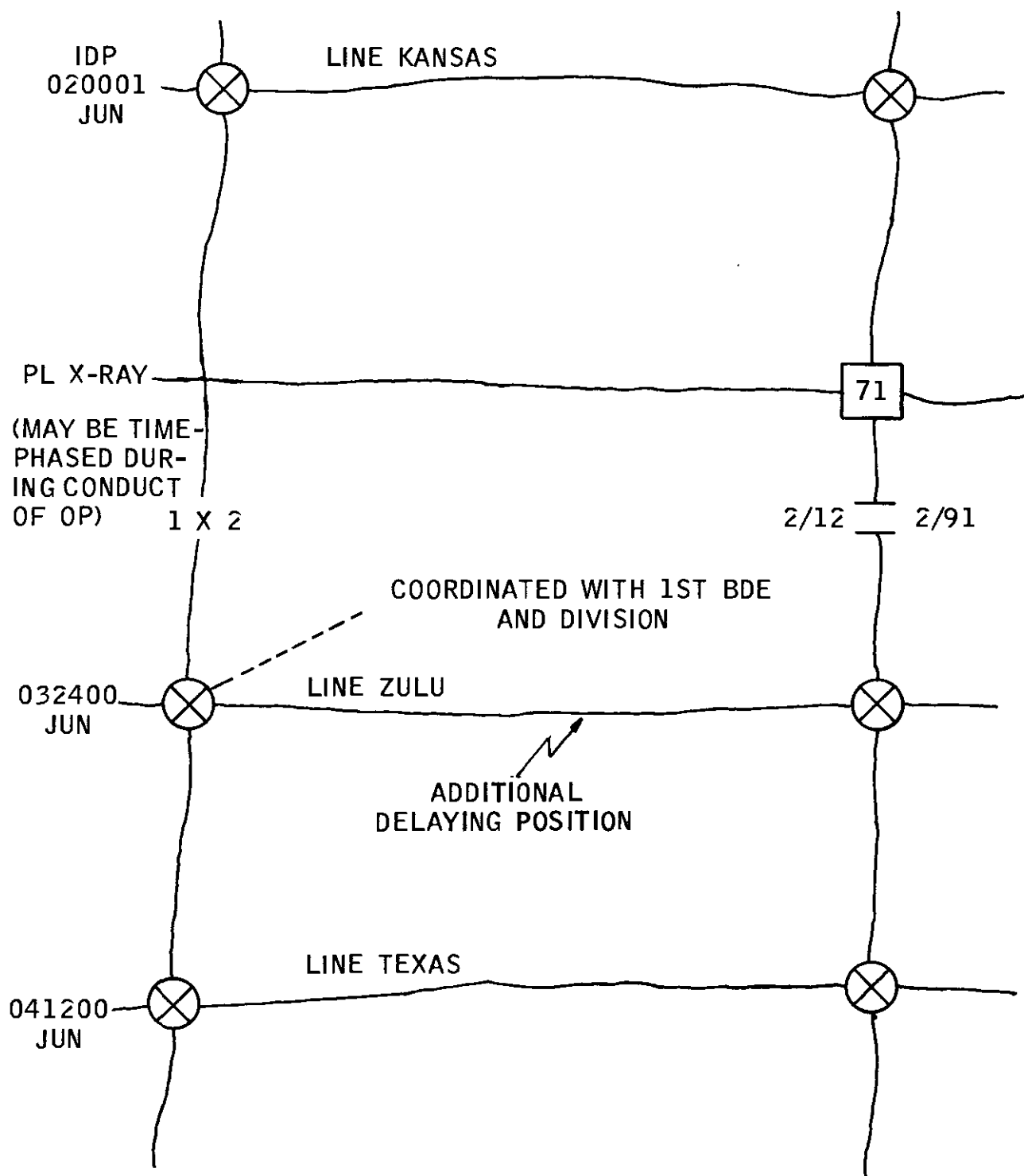


Figure 21. Additional delay positions and phase lines depicted on brigade order.

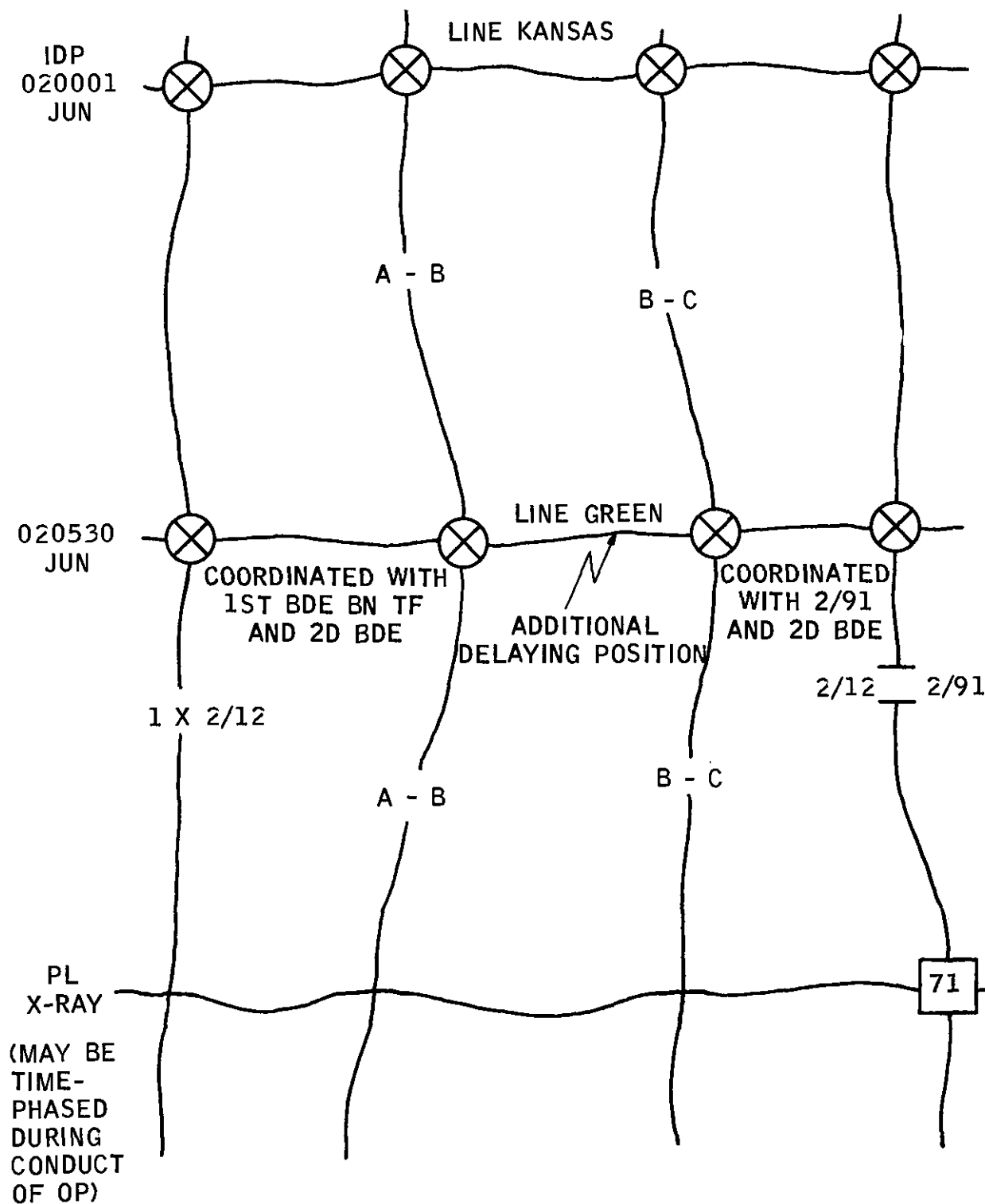


Figure 22. Battalion task force scheme of maneuver showing additional delaying positions selected by task force commander.

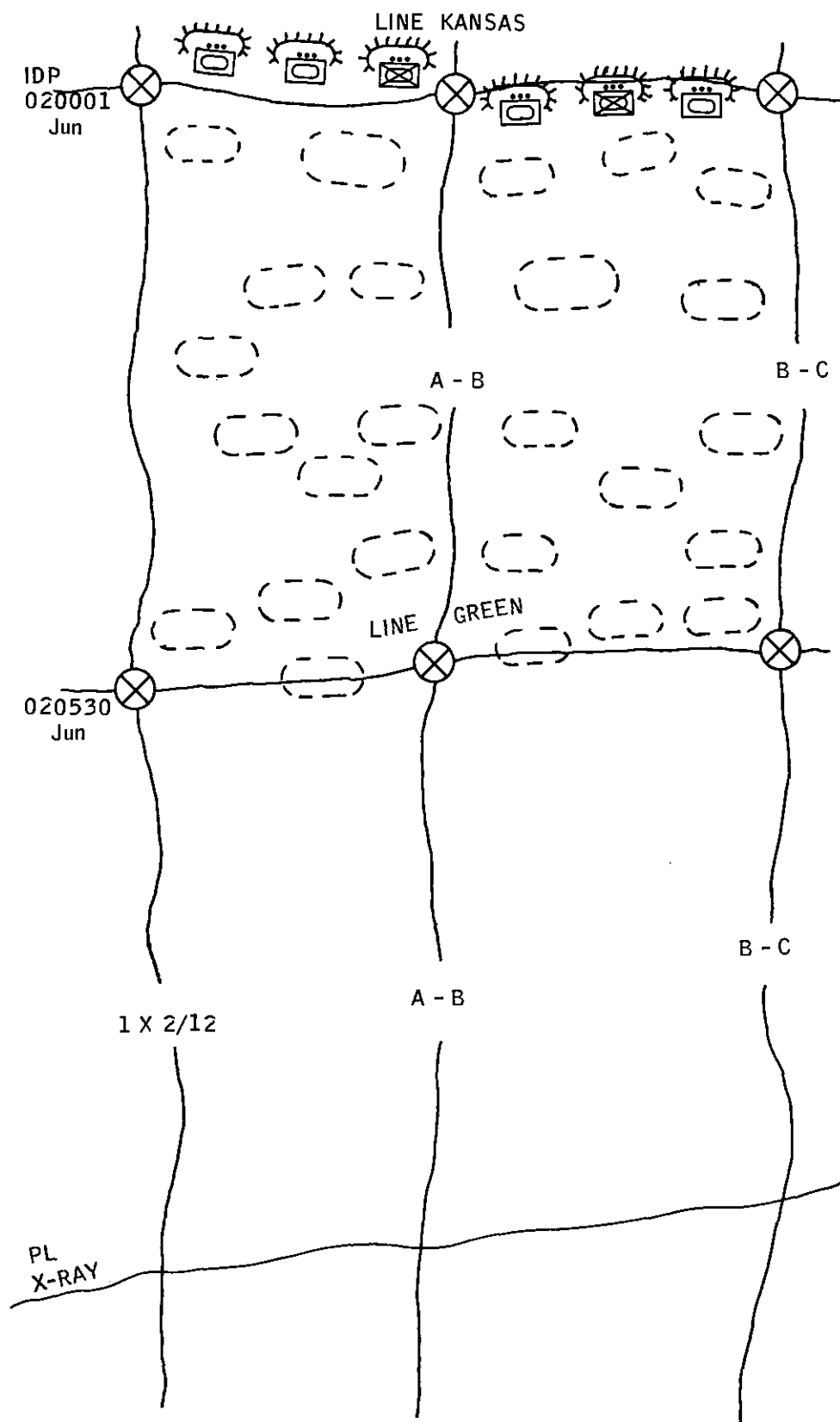


Figure 23. Company team commander's selection of blocking positions.

- (1) Security forces are organized for combat as discussed in chapter 5.
- (2) Delaying forces are organized to capitalize on the long range fires and mobility of tank units. Combat support and combat service support elements are often attached to facilitate the accomplishment of their mission in support of combat troops.
- (3) The reserves are small tank-heavy forces and nuclear weapons.

f. Routes of Withdrawal. Routes of withdrawal are selected to provide good trafficability and cover or concealment. Although withdrawal during the delaying action is normally decentralized, specific routes, together with priorities, may be assigned.

g. Logistical Plans. See paragraphs 145 and 146.

263. Conduct of Delaying Action

a. The enemy is taken under fire as soon as he is within effective range of available weapons. As he nears the position, fires are increased to inflict casualties, cause him to deploy early, and require him to take time-consuming maneuvers to close with the position.

b. Each position is defended until the enemy actions threaten decisive engagement. Commanders are alert to detect significant events that may require modification of the basic plan.

Rigid adherence to plans conceived before the enemy situation develops may prevent the accomplishment of the mission. The original concept of time-phasing may be adjusted to the situation as it develops to seize opportunities to gain greater delay than anticipated or to preserve the delaying force against an attack in overwhelming strength.

c. When the maximum possible delay has been achieved and it becomes apparent that further occupation of the position will result in the unit's becoming engaged decisively, withdrawal is begun. Withdrawals may be initiated in accordance with prearranged plans or on order of the higher commander. Affected forces must coordinate their action with adjacent units.

d. When a unit withdraws to the next delay position, elements of the unit maintain contact with the enemy. These elements provide security for the withdrawing units and continue to provide maximum delay between delaying positions utilizing maneuver, available terrain, long range fires, tactical air, mines and demolitions.

e. The opportunity to inflict heavy casualties on the enemy by offensive action should be exploited. Limited objective counterattacks and tank sweeps should be employed to gain additional time or to extricate units which have become decisively engaged.

Section IV. WITHDRAWAL

264. General

a. A withdrawal is a retrograde operation in which all or part of a deployed force disengages from the enemy. It may be executed during daylight or under cover of darkness and may be forced or voluntary.

b. During a withdrawal, contact is maintained to provide deception, security, and to prevent a rapid enemy advance.

265. Considerations

a. Plans and orders for a withdrawal are prepared in detail.

b. Sufficient information should be provided

subordinates in time to permit their making a daylight reconnaissance.

c. The withdrawal may be facilitated by the conduct of limited-objective attacks or the employment of nuclear weapons.

d. Night withdrawals are preferred over daylight withdrawals, but the protection, mobility and long range firepower of armor units enable them to conduct daylight withdrawals with greater success than units that do not have these characteristics.

266. Plans and Orders

Plans and orders include—

a. New location to be occupied and missions of units upon arrival.

b. Zones or routes of withdrawal to be used. Existing boundaries are used when possible.

c. Provision for security forces and other security measures.

d. Deception measures.

e. Time and priority of withdrawal of units.

f. Traffic control measures.

g. Provision for evacuation or destruction of excess supplies.

h. Evacuation of casualties.

i. Communication plan.

267. Night Withdrawal

Armor units in a night withdrawal may begin the operation as part of forces in contact or the reserve.

a. Part of Forces in Contact.

(1) A unit in contact designates a part of its force, both maneuver and support, to remain in contact as a security force and to cover the withdrawal of the major elements of the unit. The size and composition of the security force are based on an analysis of the factors of METT. The security force left in contact—

(a) Delays and deceives the enemy and prevents interference with the withdrawal.

(b) Simulates normal radio traffic, fires, and other activities.

(c) Is prepared to act as rear guard for the main force, on order.

(2) The withdrawing elements of the forces in contact initiate movement to the rear in the following sequence:

(a) Elements to reconnoiter and prepare new locations.

(b) Combat service support elements.

(c) Combat support units less elements essential to the support of the security force left in contact.

(d) Units in contact less the security force left in contact.

(3) The withdrawal of forward units is executed simultaneously on a broad front. Units move directly to the rear, form march columns, and proceed to

the designated location. To facilitate control, assembly areas may be designated for subordinate units before march columns are formed. These assembly areas are dispersed and are occupied for a minimum time.

(4) When the withdrawing units, less the security force, has formed march columns, further movement is conducted in a manner similar to that of a retirement (pars. 269 and 270).

(5) The security force withdraws at a prescribed time.

b. Reserve or Part of a Reserve.

(1) Units in reserve may be committed in offensive actions to facilitate the withdrawal of units in contact. See chapter 7 for a discussion of the offense.

(2) The brigade or battalion task force, as division reserve, may form a covering force through which forces in contact will withdraw. See chapter 5 for a discussion of the covering force.

268. Daylight Withdrawal

As in the night withdrawal, armor units in a daylight withdrawal may begin the operation as part of forces in contact or the reserve.

a. Part of Forces in Contact.

(1) A unit in contact provides and controls its own security force. Close coordination of these security forces is required, but control normally is not centralized above battalion. The size and composition of this security force are based on an analysis of the factors of METT. The security forces—

(a) Delay the enemy and prevent interference with the withdrawal.

(b) Are prepared to act as rear guard for the main force, on order.

(2) The movement of the main force is decentralized consistent with the requirements for control. Assembly areas are not used. Units move directly to the rear, form march columns, and continue movement without halting.

(3) Though no particular sequence is followed, normally command and support

facilities and less heavily engaged units are withdrawn first.

- (4) If a subordinate unit becomes decisively engaged, the next higher commander may use unengaged units or units that can be easily withdrawn, and fires to assist in the withdrawal of engaged elements.

b. Reserve or Part of a Reserve.

- (1) The division reserve normally will

form a covering force to assist forward units to break contact and to conduct a delaying action after withdrawal of the forward forces. See chapter 5 for a discussion of the covering force.

- (2) Brigade reserves may be used to support by fire the withdrawal of forward units, conduct limited objective counterattacks, or other offensive action.

Section V. RETIREMENT

269. Planning

a. In a retirement, the force is organized into a main force and security forces in a manner inverse to that employed in the advance to contact.

b. In the initial stage of a retirement, control may be decentralized. However, plans provide for centralized control as soon as the situation permits. Normally centralized control is effected very early in this operation as compared to the delay or withdrawal.

c. Appropriate control measures are used to insure that the retirement is conducted as a coordinated operation.

270. Conduct of the Retirement

a. When the retirement is preceded by a withdrawal, the rear guard is formed from the security force left in contact.

b. For the conduct of a tactical march, see appendix VI.

c. For the conduct of the advance, flank, and rear guards, see chapter 5.

Section VI. WITHDRAWAL THROUGH A REARWARD POSITION

271. General

Armor operations may involve many actions that require men or units to withdraw through a rearward position. The following general considerations pertain to such actions as withdrawing an outpost; return of patrols or armored cavalry units to friendly positions; termination of a covering force mission; or during a delaying action on alternate positions.

272. Considerations

a. Commanders and troops involved must be familiar with the details of the plan. Fires must be coordinated. Direct and indirect fires may be required to assist the withdrawal.

b. The commanders of the withdrawing force and the forces on position are concerned with—

- (1) *Mutual cooperation and coordination.* Neither commander exercises command over the other but each force may support the other by fire and maneuver.

- (2) *Responsibility for control of the sector.* Responsibility must be passed from the withdrawing force to the forces on position at a time and place mutually agreed upon.

- (3) *Troop density.* Withdrawing units use multiple routes through the depth of the positions and avoid the use of assembly areas or other halts within the position. Withdrawing forces normally have priority on roads. Fueling areas may be selected in rear of the friendly frontline units to provide emergency fueling if required.

- (4) *Traffic control.* Orders must specify which commander has responsibility for traffic control in the forward area.

- (5) *Control measures.* Stringent control is necessary for a smooth withdrawal through a rearward position. Measures by which the operation will be controlled are prescribed by the higher

commander or agreed upon between the commanders concerned. Deviations from preplanned control measures must be coordinated between the affected units and made known to *all* interested agencies. Control measures normally include—

- (a) *Contact points.* A point on the ground is designated where two or more units are required to make physical contact. To insure detailed coordination between the two units, a primary and alternate contact point is designated by the commander in each company sector. These points are coordinated by liaison personnel and are located on easily identifiable terrain features beyond the direct-fire range of weapons on the FEBA. Elements along the FEBA who have designated contact points will send a contact party, equipped with a radio and guides, forward to the contact point.
- (b) *Withdrawal points.* These are points on the FEBA through which friendly forces will withdraw. They must be easily recognized by withdrawing forces and are used to provide a means of reporting specific locations and information relative to the control of units. Guides from the friendly units occupying the FEBA will normally meet the withdrawing elements at the contact point and guide them through the withdrawal point on the FEBA. These actions are coordinated by the liaison personnel of the two units.
- (c) *Routes of withdrawal.* These are designated through and within a

rearward position and facilitate a smooth and continuous withdrawal. Adherence to the prescribed routes within the position is mandatory.

- (d) *Time of passage.* The overall time of passage is prescribed by the commander ordering the operation. At each subordinate level, specific times are designated for each unit by the commanders concerned. In addition, a representative of the unit with a radio will precede each march unit and provide the friendly unit being passed through with the number of vehicles to pass and a positive identification of the last vehicle.
- (e) *Recognition signals.* These are included in the order and should be based upon the SOL and unit SOP's. Positive recognition signals must be used and mutually agreed upon by the two units. Normally, recognition signals would cover both daylight and night withdrawals.
- (6) *Liaison officers.* Units exchange liaison officers at all levels of command. These officers exchange information and keep their respective commanders informed of the situation. They are normally located at critical points during the actual passage and render assistance to both the withdrawing force and the defensive force when required.
- (7) *Exchange of SOI information.* This will be accomplished during the liaison visit between the two units.
- (8) *Designation of units to move through respective withdrawal points.* This will be accomplished between the two liaison officers in their coordination of the withdrawal.

CHAPTER 10

COMBAT SUPPORT

Section I. GENERAL

273. Combat Support Elements

a. The organic combat support elements available to armor unit commanders are the fire support, communication, and aviation elements authorized by the TOE.

b. The armor unit commander can expect to receive combat support elements from higher

headquarters to the extent necessary to accomplish assigned missions. These elements may be placed in support or attached and may include artillery, engineers, signal, chemical, or aviation units. The commander must make plans for the employment of these elements in accordance with their capabilities and the mission of his unit.

Section II. FIELD ARTILLERY SUPPORT

274. General

Artillery support provides the supported commander with a powerful means of influencing the course of combat. To make effective use of artillery support, the supported commander must be familiar with artillery organization, tactical employment of artillery, and the means by which artillery fires are obtained when required.

275. Tactical Employment of Artillery

a. Tactical employment of artillery is accomplished by the assignment of an artillery tactical mission to each artillery unit; by attachment to an other artillery unit or by attachment to a supported unit. Generally, missions are not assigned to batteries within a battalion or to battalions within a field artillery group. Tactical missions for artillery units are assigned by the force commander on the recommendation of the force artillery commander. When an artillery unit is attached to a supported unit, the supported unit commander will assign an appropriate mission.

b. Artillery Tactical Missions. An artillery tactical mission defines the fire support responsibilities that may be assigned to an artillery unit. Tactical missions are direct support, general support, reinforcing, and general support-reinforcing (FM 6-20-1).

276. Armored Division Artillery

a. General. The armored division artillery consists of a headquarters and headquarters battery; three 105-mm howitzer battalions, self-propelled; a field artillery howitzer battalion, which contains three 155-mm howitzer batteries, self-propelled, and one 8-inch howitzer battery, self-propelled; and a field artillery missile battalion, Honest John rocket.

b. Organization for Combat. Field artillery units organic or attached to the division are normally employed under the centralized control of division artillery headquarters by the assignment of appropriate tactical missions to subordinate artillery units. When the tactical situation, distance between units, communication or other factors prevent centralized control of all artillery units by the division artillery commander, artillery units are attached to subordinate elements of the division.

- (1) Each of the three 105-mm howitzer battalions is normally employed as a battalion under division artillery control and in direct support of 1 of the 3 brigades. If 1 brigade is in reserve initially, the 105-mm howitzer battalion that normally supports that brigade may be assigned a general support, general support-reinforcing,

or a reinforcing mission by the division. This artillery battalion should be prepared for direct support of the reserve brigade when committed.

- (2) The 155-mm/8-inch howitzer battalion is normally employed under division artillery control in a general support or general support-reinforcing role. Each of the 155-mm howitzer batteries may be given the mission of reinforcing a direct support battalion or may be attached thereto. The 8-inch howitzer battery may be employed under division artillery or battalion control in a general support or general support-reinforcing role. When it is desirable to detach one or two howitzer sections to execute a special mission, part of the battery fire direction center must accompany these sections. The detached sections may operate under control of the battery, battalion, or they may be attached to another artillery headquarters.
- (3) The Honest John rocket battalion will normally function under division artillery control in a general support or general support-reinforcing role. However, elements of the battalion may be assigned a reinforcing mission or, when necessary, be attached to another artillery unit. The firing batteries are so organized and equipped that they are capable of operating by platoon for limited periods of time. The platoons may be attached to another artillery headquarters for special missions.

277. Fire Planning and Coordination

a. Coordination of fire support is a command responsibility. The senior artillery officer at each echelon is the fire support coordinator and principal adviser to the commander on fire support matters.

b. The plans of fire support at company, battalion, and brigade are coordinated and fully integrated to assure success of the plan of attack or defense. The plan of fire support includes fires of organic, attached, and supporting weapons. Fire planning at all times is as de-

tailed as time will permit and also is continuous. The following definitions must be understood to establish a common basis in planning:

- (1) *Fire plan.* An order for execution of planned fires by artillery units and a statement of planned requirements for air and naval gunfire supporting fires.
- (2) *Planned fires.* Fires (concentrations) planned on areas and targets for which a need can be anticipated. This includes known enemy locations, avenues of approach, observation posts, suspect weapons locations, and similar-type targets.
- (3) *Prearranged fire.* Planned fires to be fired at a specific time for which firing data are prepared in advance and kept current. They may be scheduled or on-call.
- (4) *Scheduled fires.* Prearranged fires which are to be delivered at a specific time during the operations.
- (5) *On-call fires.* Prearranged fires which are to be fired as requested.
- (6) *Concentration.* A volume of fire placed on an area within a limited time or an area designated and numbered for future references as a possible target.
- (7) *Barrage.* A prearranged barrier of fire designed to protect friendly troops and installations by impeding enemy movement across defensive lines or areas. It is fired as part of the final protective fires.
- (8) *Preparation.* Intense prearranged fire delivered in accordance with a time schedule, in support of an attack, to disrupt the enemy's communication, disorganize his defenses, and neutralize his fire support means. Preparations are conducted prior to, at, or after H-hour.
- (9) *Group of fires.* Two or more concentrations to be fired simultaneously and can be fired individually, consecutively or concurrently.
- (10) *Series of fires.* Number of concentrations or groups of fires planned to support a maneuver phase as the fires planned on an objective area just before the final assault.

- (11) *Targets of opportunity.* Targets on which fires are not prearranged.
- (12) *Final protective fires.* Final protective fires are planned defensive fires designed to break up an enemy assault. Such fires normally consist of automatic weapons firing on a final protective line, coordinated with mortar and artillery barrages. Tanks fire at targets of opportunity.

c. Fire planning and fire support coordination are accomplished at all combat echelons. At brigade level and below, fire planning and fire support coordination functions are carried out informally. Each supported unit commander has an artillery officer available to act as his fire support coordinator and who will assist in planning fire support.

- (1) *Company (team).* Normally a forward observer from the direct support artillery battalion and the battalion mortar/DC platoon will operate with each tank company. They are the principal assistants to the commander on matters of fire support. The company commander and the platoon leaders should solicit the forward observers' advice as to how the supporting artillery can best help the company in any particular situation. The commander is responsible for providing an armor protected vehicle with communication facilities to the forward observers when required. Radio is the primary means of communication for requesting and controlling fire support.

- (a) In the initial planning phase of an operation, the company commander must discuss the company's mission and his concept of operation with the platoon leaders and the forward observers. The platoon leaders in planning the employment of their platoon may submit requirements or recommendations for supporting fires to either the company commander or the forward observers. Based on the commander's concept of the operation, his plan of fire support, and requirements submitted

by the platoon leaders, the company commander and the artillery forward observer formulate a plan of fire support. They select targets that must be engaged to support the operation and decide the best method of attacking them. Targets suitable for attack by the company's organic weapons are assigned to those weapons so far as their capabilities and available ammunition permit. In addition, the company commander and artillery forward observers prepare a fire plan to support the company's scheme of maneuver. Included in this plan are the targets not susceptible to profitable attack by organic weapons. This fire plan is normally only a target list showing location and description of targets. This plan or target list is sent to battalion headquarters where the artillery liaison officer incorporates it into the battalion fire plan.

- (b) During the conduct of the operation, requests for artillery and mortar fires are processed through the artillery and mortar forward observers respectively. They transmit these requests to the supporting fire direction center and adjust fire upon the designated target. The forward observers may call for fire on their own initiative on targets that affect the actions of the company. They locate themselves where they can best observe and adjust fire in support of the company. They must maintain communication with both the supported company and the supporting fire direction center. When the company commander desires supporting fire, he will normally request the fire through the forward observers who will transmit the request direct to the supporting fire direction center. If the company commander cannot contact the forward observers, he may send his request to the battalion fire support coordinator (FSCOORD) by using

the battalion task force command communication net. The FSCOORD will then transmit the request to the supporting fire direction center. A platoon leader should send his request for supporting fire direct to the forward observers with the company; however, if a platoon leader cannot contact the forward observers, he should send his request to his company commander. In either case, the company commander and the forward observers, if practical, will discuss all requests for fire before sending them to the appropriate headquarters.

- (c) Initial fire requests should include, as a minimum, the following elements:

1. Identification of observer.
2. Warning order. The observer alerts the recipient of the message as to the nature of the message by saying FIRE MISSION.
3. Location of target, and azimuth from observer to target. The sequence of these elements depends upon the manner of reporting the location of the target (*d* below).
4. Description of target.
5. Control. The observer's designation of control is expressed as WILL ADJUST or FIRE FOR EFFECT. If the observer is certain that his location of the target is accurate within 50 yards, his control should be FIRE FOR EFFECT. If he is not certain of the accuracy of the location of his targets, and feels that adjustment of the fire upon the target is required, his control should be WILL ADJUST.

- (d) Examples of initial fire requests are shown below.

1. POWER ALFA 6.
FIRE MISSION
COORDINATES 385624
AZIMUTH 300
PLATOON OF INFANTRY IN
OPEN
WILL ADJUST

2. BLUE GRASS 26
FIRE MISSION
FROM CONCENTRATION DA
200, AZIMUTH
2450, RIGHT 200, ADD 400
MACHINEGUN DUG IN
FIRE FOR EFFECT

- (2) *Battalion (task force)*. The artillery liaison officer at battalion task force is the fire support coordinator for the task force. As such, he is the principal adviser to the task force commander on all fire support means.

- (a) Based on the supported commander's concept of the operation and the fire plans or requests received from the artillery forward observers with the companies, he prepares the artillery fire plan to support the actions of the battalion task force. Additionally, he supervises the preparation of all other fire plans and formulates the fire support plan for the task force.
- (b) The fire support plan normally includes the fire plans for the employment of the supporting artillery, tactical air support, and the organic weapons of the task force.
- (c) As the fire support coordinator, the liaison officer insures that targets that would affect the accomplishment of the mission of the battalion task force are attacked as rapidly as possible with the best fire support means. If sufficient means are not available, he will request additional support through artillery channels.
- (d) When the fire support plan and all supporting fire plans are completed, they are sent to the artillery liaison officer at brigade if time permits; otherwise, they may be sent direct to the supporting artillery battalion fire direction center.
- (e) The artillery liaison officer is assisted by representatives of other fire support agencies available to the battalion.
 1. When tactical air support is available, a forward air controller

(FAC) is furnished the unit by the air Force (pars. 290–295).

2. The battalion task force S3 air represents the battalion staff on this fire support coordination team. He formulates and prepares the air fire plan to support the battalion task force.
 3. The 4.2-inch mortar and Davy Crockett (DC) platoon leader advises on the employment of the Davy Crockett and 4.2-inch mortars. He prepares the mortar fire plan for the battalion task force.
- (f) In a battalion-size task force, the fire support coordination personnel will not be present at the command post at all times, because they have duties which must be performed elsewhere. During the planning phase of an operation, these officers get together informally to solve any problems of fire support that arise.
- (3) *Brigade.* At brigade level, the supporting artillery battalion commander is the fire support coordinator for the brigade. He makes recommendations on the employment of his battalion, and on the basis of the commander's decision, coordinates and integrates the various fire plans to support the brigade.
- (a) In the absence of the supporting artillery commanders, the artillery liaison officers at brigade acts as the fire support coordinator. In actual practice, a large portion of the detailed work of coordination will be

performed by this officer and his section.

- (b) When the fire support coordinator at brigade receives the fire plans from the battalion task forces, he integrates them into the fire plans to support the brigade. Based on the fire plans received from the battalion task forces and on the brigade commander's guidance for employment of all available fire support, the liaison officer formulates and prepares the fire support plan and the artillery fire plan to support the brigade. He is assisted by the forward air controller with the brigade and the brigade S3 air. Their duties are the same as outlined at battalion/task force level.
- (c) When the fire support plan for the brigade is completed, it is sent to the S3 of the supporting artillery battalion, who makes final changes and additions. After completion, it must be approved by the brigade commander; it is then sent to the division artillery S3 who integrates it into the division fire support plan, which is issued as an annex to the division operation order.

278. Fire Support Control Measures

Certain control measures must be established to protect the safety of friendly troops and to permit maximum support with minimum restrictions. All of the control measures are established in coordination with the supported commander (app. X).

Section III. ARMY AVIATION

279. General

Army aviation enhances the mobility, versatility, and combat efficiency of ground combat forces. The air vehicle provides the commander the capability to move rapidly throughout the area of operation to influence critical actions by his personal presence. Properly employed, the air vehicle and aviation units can provide timely information of the enemy and area of operation that may not be available through other agen-

cies. This timely information enhances the ability of the commander to fully exploit the mobility, shock effect, and firepower of armor units at the time and place of his choosing (FM 1–5, FM 1–15, FM 1–100, and FM 57–35).

280. Brigade Aviation Section

The brigade aviation section provides armed air vehicles to facilitate command and control and provide air reconnaissance and liaison for

the commander and staff of the brigade and attached combat maneuver battalions. The section is employed normally under brigade control and operates from a heliport in the vicinity of the brigade command post. Elements of the section are placed in support of, or under the operational control of, combat battalions attached to the brigade based on priorities established by the commander.

a. The brigade may be augmented by air vehicles from the division aviation battalion. Army transport aviation units assigned to the field army may be attached to division and placed in support of the brigade, or when the mission dictates a continuing requirement for transport aviation, the units may be attached to the brigade.

b. The duties of the brigade aviation officer correspond to those of the division aviation officer (FM 101-5). He is the brigade aviation staff officer and advises the commander on the employment of organic and attached aviation elements. In coordination with the brigade S3, he plans and coordinates the employment of organic and supporting air vehicles in the brigade area of operation, including air traffic control and coordination with air defense agencies.

281. Division Aviation Battalion

The aviation battalion provides general support for the division. The battalion is normally employed in two echelons.

a. One element normally consists of the head-

quarters and headquarters company and the general support company. This element is normally located in the vicinity of the division instrumented airfield.

(1) The headquarters and headquarters company provides the personnel and equipment to operate the division instrumented airfield and to provide air traffic control and coordination with aid defense agencies in the division area of operation. The aviation battalion commander is also the division aviation staff officer and advises the commander and staff on the employment of organic and attached aviation units and on all other matters pertaining to Army aviation (FM 101-5).

(2) The general support aviation company provides visual, photographic, and electronic air surveillance and furnishes air vehicles for the division commander and staff and other units of the division on a priority basis.

b. The second element consists of the airmobile company, which provides tactical troop-lift capability of one dismounted rifle company; air supply; and emergency medical evacuation. The airmobile company operates from a tactical location in proximity of the supported unit. The company is normally employed under division control, but the company or platoons may be attached to or placed in support of, or under the operational control of, a brigade.

Section IV. CHEMICAL

282. General

Guidance relative to the employment of toxics by armor units will be received through command channels. There are no restrictions on the initial employment of nontoxic agents such as flame, smoke, and defoliants. After use of toxic agents is authorized, their employment will be planned and executed subject to policy restrictions of higher headquarters. Operations involving the use of toxic biological agents will normally be planned and executed by corps or higher units. Chemical employment planning parallels fire planning and plans are forwarded to division for inclusion in division plans.

283. Chemical Support Units

a. Certain chemical units may be attached or in support of brigade or battalion operations or may be operating in the brigade zone of action. These may include the following:

(1) *Chemical company, combat support.* This organization provides chemical support to combat units, including servicing of portable or mechanized flamethrowers, preparation of flame field expedients, and preparation of flame or toxic minefields; CBR monitoring, survey, or reconnaissance; limited decontamination of critical

areas and materiel; supervision of unit decontamination; operation of one personnel decontamination station; supervision of unit field impregnation of clothing; and third-echelon maintenance of Chemical Corps equipment. These tasks are assigned on a priority basis or as directed by the supported commander within the capabilities of the unit.

- (2) *Chemical company, smoke generator.* This unit provides concealment of

troops or installations under all operating conditions by the use of smoke.

- (3) *Chemical decontamination company.* This unit provides third-echelon decontamination for vehicles and equipment or large quantities of supplies. It is capable of functioning as a fire-fighting unit and providing mobile shower service.

b. These chemical units are equipped to defend themselves against hostile ground attack and are 100 percent mobile.

Section V. ENGINEER

284. Division Engineer Battalion

a. *General.* The primary mission of the division engineer battalion is to increase the combat effectiveness of the division by means of general engineer work. A secondary mission is to undertake and carry out combat missions when required.

b. *Capabilities.* The division engineer battalion is specially organized, equipped, and trained to perform tasks that assist division units. These tasks include—

- (1) Providing engineer staff planning and supervision of organic and attached engineer troops.
- (2) Performing construction, repair, and the maintenance of roads, bridges, fords, and culverts.
- (3) Providing support to hasty stream crossing operations by providing boats, rafts, and bridges, and preparing deep-fording sites; and coordinating organic and attached engineer troops to support of deliberate stream crossings.
- (4) Providing fixed bridging for passage of short gaps.
- (5) Assisting in the removal of obstacles, including mines.
- (6) Assisting in the emplacement of obstacles, including minefields.
- (7) Preparing and executing demolitions, including employment of nuclear demolitions (ADM).
- (8) Assisting other troops in the preparation of field fortification, camouflage, and deception devices.

- (9) Performing engineer reconnaissance and intelligence missions.
- (10) Accomplishing general construction, including construction of airlanding facilities.
- (11) Producing a supply of potable water.
- (12) Providing assistance in the assault of fortified positions.
- (13) Conducting combat missions, when required.

c. *Employment.*

- (1) *General.* The division engineer battalion is designed to provide an optimum combination of engineer equipment and individual skills for combat engineer tasks. Some of these tasks are performed by the battalion operating as a unit; however, most of them are accomplished by the combat engineer companies and platoons that support the bridges, battalion tasks forces, or company teams. These engineer units may be reinforced with engineer construction equipment from headquarters and headquarters company and stream crossing equipment and assault bridging from bridge company (FM 5-135).

(2) *Fundamentals of employment.*

- (a) *Combat engineer support is allocated on the basis of anticipated engineer work as determined by the factors of METT.* The amount of engineer support allocated to a tactical unit is based on the anticipated engineer work, as determined by the

mission of the tactical unit, capabilities of the enemy, scheme of maneuver, type of terrain, expected weather conditions, and capabilities and amount of engineer effort available.

- (b) *Combat engineer units are used most effectively and efficiently in a direct support status.* Greater flexibility and efficiency in the overall engineer effort are realized by retaining the subordinate engineer elements under the control of its parent engineer unit. However, engineers are *attached* when distance, terrain, or mission make operation under the control of the parent unit impractical and undesirable. These conditions will often exist in such operations as the offense, exploitation, and pursuit, or if one brigade or battalion task force is conducting an independent mission.
- (c) *In an offensive action, engineer elements must be positioned to facilitate the movement of the maneuver forces.* To render effective support to the attacking force it is essential that combat engineer units be located well forward. This forward location facilitates rapid stream crossing and the removal or breaching of obstacles that cannot be bypassed. This technique enables the engineer commander to maintain constant liaison, to anticipate the needs of the attacking troops, and to have maximum engineer effort available for meeting these needs promptly.
- (d) *In a defensive situation, the location of the engineer units is dictated by the assigned task priorities.* In a defensive operation, the senior commander specifies the form of defense, and the priorities of engineer tasks. These engineer tasks are normally accomplished by attaching a reinforced engineer unit to the security force; placing a reinforced

engineer unit in direct support of each brigade occupying the forward defensive area, and retaining the remainder of the available engineer effort in general support of the division. An engineer unit reinforced with assault bridging is normally attached to the striking force/reserve when committed. This engineer commander establishes early liaison with the commander of the striking force/reserve and functions as his engineer staff officer during all planning. This engineer unit also assists in the preparation of blocking positions, improvement of counterattack routes, and coordination and rehearsals of counterattack plans.

- (e) *In a retrograde operation, engineer units should be positioned to achieve maximum impediment of the enemy.* Proper coordination and execution of engineer tasks in retrograde operations normally require the attachment of the engineer elements to the delay force in a delaying action; the rear guard in a retirement; or the detachments left in contact in a withdrawal. The obstacle plan is prepared so as not to interfere with future operations. Engineers may destroy bridges and culverts, block roads, lay mines, destroy stores (supplies), and demolish railways and rolling stock in carrying out the obstacle plan. The engineers in coordination with combat and other combat support units prepare successive delaying positions and maintain routes of withdrawal.
- (f) *The senior engineer representative functions as the tactical unit's engineer staff officer.* At all command echelons, the senior engineer officer of the engineer unit organic, supporting or attached to that command functions as the engineer staff officer (FM 101-5).
- (g) *Considerations for commitment of engineers to a combat mission.*

1. *Mission of tactical force.*

- (a) Will the enemy force be able to seriously affect the tactical force if the engineer unit is not committed?
- (b) Can the tactical force afford the temporary loss of the engineer unit and the possible degradation of the future engineer capability?

2. *Capabilities of the engineer unit.*

- (a) Is the combat strength of the engineer unit sufficient to significantly influence the action if committed?
- (b) What combat support will the engineer unit need to perform the combat mission?
- (c) Could the available engineer unit be committed piecemeal as reinforcement for existing combat units thereby achieving a better tactical posture?

- (d) How quickly can the engineer unit be modified to assume a combat mission?
- (e) Does the equipment of the engineer unit lend itself to commitment in the current tactical situation?

(h) *Conduct.* Commitment of an engineer unit to a combat mission is not instantaneous, it requires time for the engineer unit to prepare for such a mission. Normal organization of the engineer platoon or company is modified to provide effective use and control of crew-served weapons; security of equipment not needed for combat; and the special requirements of command, communication, and supply in combat. The extent of modification varies with the size of the engineer unit, the time available, and the mission (FM 5-135).

Section VI. COMMUNICATIONS

285. General

Communication is a function of command. Each armor unit commander is responsible for the establishment, operation, and maintenance, within his capabilities, of the communication system of his command. He must adhere to the following principles in establishing and operating his communication system:

a. The communication system must be organized to fit the unit task organization. The communication systems of subordinate and supporting elements must be integrated into the unit communication system.

b. All the communication means of the unit must be placed to the maximum. This prevents overloading any 1 means and minimizes the effect of a disruption of 1 or more means.

286. Communication Means

Radio is the means of communication used most in armor units. Wire, messenger, visual, and sound communication are supplemental means employed extensively under certain circumstances. Instructions for the use of these

means are contained in SSI's, SOI's, and other pertinent directives.

a. Radio. The flexibility of radio communication affords the unit commander the ability to control and coordinate subordinate elements, yet does not restrict maneuver of these elements. Radio communication may be affected adversely by enemy jamming, unfavorable terrain, and weather. Armor leaders habitually operate their own voice radios to insure the direct and personal contact characteristics of armor command. Five general classes of radios are employed by armor units:

- (1) *Mounted FM radios.* These radios, mounted in ground and air vehicles consist of combinations of components, depending on the communication requirements of the user. The components include medium-power transceivers with a range of approximately 20 miles, an auxiliary receiver, and low-power transceivers with a range of 3 to 5 miles.
- (2) *Portable FM radios.* Portable FM radios are back-packed or hand-

carried and have a range of from 500 meters to 5 miles depending on the type radio or antenna used.

- (3) Vehicular-mounted AM radios. These radios are medium-power voice or CW sets, the bulk of which have a range of approximately 50 miles and some 25 miles. Both sets have a range of 75 miles on CW.
- (4) *Vehicular-mounted UHF ground-to-air radios.* These radios are voice operated, with a ground to aircraft range of up to 135 miles depending upon the altitude of the aircraft.
- (5) *Vehicular-mounted AM radioteletype equipment.* This equipment provides radioteletype, CW, or voice communication over a distance of from 50 to 75 miles depending upon the mode of transmission used.

b. Wire. Wire communication supplements radio and is used whenever practicable. The installation of wire is dependent on the situation and the time available. It is used mainly in defensive situations and in assembly areas.

c. Messengers. Messengers are used to supplement radio and wire. Messenger communication is more secure and dependable generally than other means but lacks the speed inherent in radio or wire communication. Use of *air messenger service* will speed delivery time.

d. Visual and Sound. Visual and sound means include lights, flags, panels, arm-and-hand signals, pyrotechnics, alarms, shots, and horns. Their use is restricted by distance, visibility, security, and the nature of the signal. Messages are necessarily simple. Visual communication is used mainly for identification of vehicles and units, for alarms, and, to a limited extent, for brief controls signals.

287. Employment of the Battalion Communication Platoon

The battalion communication platoon installs and operates major parts of the battalion com-

munication system and performs organizational maintenance on communication equipment organic to the battalion headquarters and headquarters company. The communication officer advises company commanders on the employment of their communication personnel and supervises the operation of the battalion communication system. The communication platoon provides the following services:

- a.* Operates the battalion message center and provides messenger service.
- b.* Installs wire lines to subordinate units and staff sections when required.
- c.* Operates the battalion switchboard, panel displays, and message pickup facilities.
- d.* Provides facilities for encrypting and decrypting messages.
- e.* Assists the S4 in the control and evacuation of signal equipment from organic battalion elements.

288. Liaison

a. Liaison is a means of establishing communication. Each commander maintains liaison with higher headquarters, supported units, and adjacent units by any means available.

b. Liaison may be accomplished by personal conference between commanders or by means of a liaison agent or officer who represents the commander. Usually both methods are employed concurrently.

289. Communication Security

The armor unit commander is responsible for the security of his communication system, which includes all measures taken to prevent or delay the enemy from gaining information from friendly communication systems. The commander must determine the maximum degree of communication security that he can employ consistent with his mission and the reaction time of the enemy.

Section VII. TACTICAL AIR SUPPORT

290. General

a. Tactical air support consists of close air support and tactical air reconnaissance in areas of concern to the ground commander.

b. When close air support is available, a forward air controller, an Air Force officer, (FAC), is provided to the supported unit. The FAC aids and advises the ground commander

on employment of tactical air support. Close liaison should be maintained between the forward air controller and the supporting artillery liaison officer. This will insure prompt exchange of information from both ground and air observation, and will assist in rapid engagement of targets of opportunity. The FAC should remain with the command post or command group until an airstrike is designated. He is provided with the necessary information to enable him to communicate with Army air vehicles which may be expected in the immediate area. He then moves to a point where he can observe and direct the airstrike. The FAC uses the equipment and personnel of the air control team (ACT) organic to the battalion he is supporting.

c. Air targets are targets beyond the range or capability of other supporting weapons. Targets for supporting tactical air include enemy armor, enemy columns, targets out of range of artillery, enemy strongpoints, and enemy communication centers. Tactical air may perform visual, photographic, weather, or electronic reconnaissance missions, and make a 24-hour a day all-weather light bombardment attack.

291. Tactical Close-Air Support Requests

There are two types of requests for close support air missions.

a. *Preplanned.* A preplanned mission is one that is decided upon early enough to allow complete planning and thorough preparation. The deadline for submission is outlined by orders (SOP). A preplanned air request should include the following information:

- (1) *Target location.* Coordinates; speed and direction, if moving; location with regard to prominent landmarks.
- (2) *Target description.* Guns: size, hasty or fortified positions, camouflage. Strongpoints: size, and type of construction.
- (3) *Time on target (TOT).* Specify limits, if any.
- (4) *Troops.* Bivouac, marching, type of dugouts, and their depth. Supply areas: size, dispersed or concentrated, revetted or in the open, and class of supply.

- (5) *Results desired.* Destruction, neutralization, harassment limitations.
- (6) *Tactical significance.* How attack will aid mission of requesting unit.
- (7) *Target distance and direction from troops.* Distance and azimuth or limiting coordinates of troops positions, landmarks if possible.
- (8) *Special control information.* Special bomblines; marking of frontlines, whether marked on call of pilot or otherwise; facilities available for marking targets; desired direction of attack.
- (9) *Other pertinent information.* Will flak suppression be provided? Artillery and naval gunfire maximum ordinate; ACT identification and location.

Note. Photo requests should contain information as to type of photography, scale, information desired, and quantity of prints. Visual reconnaissance should include specific area or route to be covered.

b. *Immediate.* An immediate mission is a request for which the need for close air support cannot be foreseen and planned for in advance. When there is such a requirement, time is of the greatest importance. This type of request is used when air support is required to repel an unexpected enemy attack, disrupt enemy concentrations, overcome unforeseen resistance, or attack targets that are fleeting in nature. An immediate air request contains, as an absolute minimum, the following information:

- (1) Target location.
- (2) Target description.
- (3) Time on target.

292. Control Measure

To insure the safety of friendly troops and installations, a fire support coordination line (FSCL) is established on the ground by the ground forces, generally by field army headquarters. This is a line beyond which the Air Force or other agencies may attack targets without danger to, or approval from, the ground forces. The movement of the FSCL must be anticipated and appropriate recommendations must be submitted enough in advance to insure dissemination to tactical air force. The FSCL must be easily identifiable by terrain features from the air and ground, to prevent confusion

and accidental air attacks on friendly ground forces. Tactical aircraft may attack targets short of the FSCL when ground forces request, or give clearance for, such an attack.

293. Close Air Support

The following types of missions are employed normally in close air support operations:

a. Column-cover missions are performed usually by tactical fighter aircraft and are accomplished by positioning the aircraft over the ground formation to perform visual reconnaissance to the front, rear, and flanks, and to attack enemy air or ground elements that impede or threaten the progress of the ground force. An air control team (ACT) is located usually in one of the forward armored vehicles and directs aircraft onto targets. The column cover mission is of great assistance to armor in the exploitation of enemy disorganization and weakened resistance following a breakthrough. Aircraft on column cover missions can often neutralize elements of impending enemy resistance before these elements have been contacted by friendly ground forces.

b. Bombing missions are employed in close air support to destroy strongpoints, concentrations of troops, and vehicles. These missions are carried out by tactical fighter aircraft and tactical bombers.

c. Air-to-ground strike (ground attack) missions are the backbone of close air support. Heavily armed tactical fighters execute their missions by attacking weapons positions, tanks, troops, vehicles, and other equipment.

d. Special missions may include such missions as electronic countermeasures performed by specially equipped aircraft to neutralize enemy electronic equipment.

294. Armament

a. Bombs. Bombs are used to destroy or neutralize a selected target. This is achieved

usually by blast, shock, fragmentation, or fire effect. Varied fuse arrangements are used to control bomb bursts as desired. Types of bombs that may be used by tactical air support aircraft are—

- (1) Fragmentation (against personnel and aircraft on the ground).
- (2) General purpose (same as HE shell).
- (3) Special purpose:
 - (a) Penetrating.
 - (b) Demolition.
 - (c) Chemical
 - (d) Mining.
 - (e) Napalm.
- (4) Nuclear.

b. Rockets. Air-to-air and air-to-ground rockets are used to destroy small targets such as tanks, armored vehicles, trucks, gun emplacements, strongpoints, and aircraft.

c. Machineguns and Cannon. These weapons are an integral part of armament of tactical fighters.

- (1) High cyclic rate of fire.
- (2) High muzzle velocity.

d. Missiles. These weapons may be employed air-to-air or air-to-surface. There are two general types: guided and nonguided.

e. Chemical Spray. Tactical air support aircraft usually can be fitted with chemical tanks to deliver smokescreens or spray attacks.

295. Typical Targets for Close Air Support

- a.* Weapon positions.
- b.* Vehicles and armor.
- c.* Command posts.
- d.* Troop concentrations.
- e.* Strongly defended positions.
- f.* Missile launch sites.
- g.* Defended roadblocks.

Section VIII. INTELLIGENCE

296. General

Combat intelligence is intelligence for use in a combat area, whether based upon information collected locally or provided by higher headquarters. An armor commander uses the three

elements of combat intelligence—information of the terrain, weather, and the enemy—in the execution of any combat mission (app. XII). Information of the enemy situation is normally the most critical intelligence requirement be-

cause this information is difficult to obtain. The S2 must be certain that routine intelligence production activities are undertaken in order of urgency to insure that the commander is provided with answers to his intelligence questions in time to be of use. Forward armor units constitute a major source of combat information. The S3 must support the intelligence effort by understanding and accepting conclusions concerning the effects of the weather, the terrain, and the enemy situation on the operation plan. An effective collection effort must be made to determine the existing enemy situation. This permits the commander to develop plans that take advantage of weather and terrain and exploit known enemy weaknesses. The actions of the unit generate combat information for its own use and for use of higher headquarters in the production of combat intelligence (FM 30-5 and FM 30-7).

297. Agencies

Many agencies and organizations exist for the sole purpose of producing or assisting in the production of combat intelligence. They should be used to the fullest by commanders and staffs at all levels to assist in gathering information. The agencies and organizations that will most frequently be in support or attached are—

a. Divisional Agencies.

- (1) Artillery forward observers.
- (2) PW interrogation teams.
- (3) Armored cavalry squadron.
- (4) Aerial surveillance and target acquisition platoon.

b. *Nondivisional Agencies* (normally not under brigade or battalion task force control, but frequently in the area of operations).

- (1) *U.S. Army Security Agency division support company.* This company supports the division and its units by assisting in the maintenance of communication security and providing communication intelligence. Elements of this company may be working in the brigade and battalion areas and can be of great assistance to the commander if informed of the brigade

and battalion intelligence requirements.

- (2) *Combat electronic warfare company.* This company may be attached or in support of the division. It provides the division G2 information regarding enemy electronic equipment, organization, and locations by detecting and studying enemy electromagnetic transmissions. Information gathered by this unit can be obtained through intelligence channels.
- (3) *Technical service intelligence detachments.* Each technical service has available technical intelligence detachments for support of the division. Technical intelligence information required by brigade or battalion S2's can be obtained through normal intelligence channels.
- (4) *Military intelligence detachment.* This detachment performs specialized intelligence and counterintelligence functions that require the employment of special skills or foreign language in support of the armored cavalry regiment or separate armored or infantry brigades. The detachment provides the cavalry regiment, or separate armored or infantry brigade S2, assistance in the specialized fields of order of battle, imagery interpretation, interrogation of prisoners of war, document translation, and counterintelligence activities.

298. Reconnaissance

Effective reconnaissance provides much of the information necessary for the conduct of operations (ch. 5).

299. Target Acquisition

Targets result from study or interpretation of the data supplied by many sources and agencies. Speed and accuracy in reporting are vital for successful engagement and destruction of targets. Soldiers must be trained to report all enemy activity or, in some cases, lack of enemy activity.

300. Surveillance

Surveillance involves the systematic observation of the battlefield by visual, electronic, photographic, and other means. It must be conducted on an all-weather, day-and-night basis to provide timely information to support combat operations. Appendix XXII provides guidance on the employment of ground radar.

301. Counterintelligence

Counterintelligence consists of means to deceive the enemy, deny the enemy information, and detect and expose, or neutralize, the enemy intelligence effort. Active counterintelligence measures block the enemy's attempts to gain information or to engage in sabotage or sub-

version. Among these measures are counter-espionage, countersabotage, countersubversion, and the use of smoke to deny observation. Security of a unit can be so effective that it can deny the enemy any information and thus aid in achieving surprise. Passive counterintelligence measures conceal information from the enemy; they include censorship, security of classified documents and materiel, signal communication security, concealment, camouflage, electronic countermeasures, and control of civil population. A part of the division security section may be attached to brigade to advise the commander on counterintelligence measures. The S2 assists in planning and supervising unit counterintelligence training.

CHAPTER 11

OTHER OPERATIONS — ENVIRONMENT

Section I. GENERAL

302. General

a. Armor units may have to be augmented with additional equipment or special equipment as required by the geographical area, nature of operations, or a combination of these factors. This generally requires special considerations in training, techniques of operation, tactics, maintenance, and logistical support.

b. Tactics. The fundamentals of employment and conduct of tactical operations for armor units discussed elsewhere in this text are applicable, when modified, to meet the conditions of environment.

c. Maintenance. Under conditions of extreme environment, maintenance is emphasized more than in normal operations. Special care is required for metal surfaces to prevent rusting;

icing or frosting; or sand accumulating. Communication equipment is waterproofed, fungus-proofed, or given other preventive maintenance. Special lubricants are required generally for vehicles.

303. Logistics

Careful planning is essential to support operations conducted in extreme environments. The lack of supply routes will in many instances place great reliance on air vehicles to supply units. The quantities of all classes of supply will vary greatly depending upon the environment. For example, in jungle operations, greater quantities of class V are needed, while in cold weather operations and desert operations, class III supplies are in greater demand.

Section II. JUNGLE OPERATIONS

304. General

Jungle combat involves operations in tropical areas that are very rugged, with swamps, deep valleys, steep ridges, and areas largely overgrown with dense vegetation. The conduct of combat operations requires a high degree of leadership and individual initiative to meet the problems imposed by climatic conditions, land forms, and vegetation. These problems may be overcome by proper acclimatization, training, and careful planning (FM 31-30).

305. Effects of Jungle

a. The jungle affects operations by restricting observation, fields of fire, movement, and communication, and by providing concealment from air and ground observation. These factors make control difficult and continuous contact virtually impossible. In jungle operations, the leader is normally faced with situations that at

best are vague. Narrower frontages than normal are assigned to attacking forces, and distances between units and individuals are reduced. The use of supporting fires is restricted.

b. Jungle areas seldom have good roads. The road net consists usually of a few roads on the edge of the jungle and narrow, winding trails in the interior. Movement of armor units is limited generally to roads, beaches, and grass- or brush-covered fields. Cross-country movement of armored vehicles in dense jungle is almost impossible unless routes have been prepared previously. Sometimes armored vehicles can operate in an area of tree-covered hills.

c. Radio range is reduced greatly because of the screening effect of dense vegetation and steep slopes. The effectiveness of radio depends upon the radio's location and the atmospheric conditions. In a slow-moving attack, wire is the most satisfactory means of communication.

Wire teams move with the assault echelon to provide communication to the rear. Increased reliance is placed on dismounted messengers and prearranged visual signals.

d. The jungle gives ideal concealment for offensive operations. This permits dismounted infantry to advance close to the enemy before launching their attack. However, concealing foliage also permits ambush and infiltration attacks, and requires increased security.

e. Certain effects of particular interest to armor should be considered in nuclear warfare in jungles—shielding by thick vegetation; severe obstacles created by blowdown; and difficulty in accurately locating suitable nuclear targets.

306. Offensive Operations in Jungle

a. The fundamentals of employment and considerations of the offense, for armor forces, apply to offensive combat in jungles. Roads, trails, and rivers are key terrain in jungle operations. Mounting flame kits on a number of tanks in each tank company and the increase use of the cannister round should be considered since jungle conditions often require a variety of munitions.

b. Jungle combat is essentially a fight by small dismounted infantry units operating extremely close to the enemy. A tank platoon may be attached to an assault rifle company to reduce enemy automatic weapons by close-range fires. In close terrain, dismounted troops and tanks move together at the same rate of speed. On trails, dismounted troops generally precede the tanks at about 25 to 50 meters, depending on the terrain and enemy resistance. At times

the terrain may restrict deployment to the vicinity of the trail and may limit operations to a one-tank front. Tanks must be protected closely by dismounted patrols that reconnoiter for routes of advance, antitank guns, and anti-tank obstacles. Rifleman are designated to protect the flanks and rear of each tank. When the tanks are engaged, rifleman use the tanks as a shield while determining the location of the enemy firing position. When the enemy is located the tank-infantry team attack and destroy him. At times, close terrain makes it necessary for a tank commander to expose himself from the turret to locate targets and maintain contact with nearby tanks.

c. Sometimes the terrain makes it impossible for tanks to take part in the assault. In this case the tanks may support the attack with overhead and flanking fire. A tank forward observer may go with the assault rifle company to call for supporting fires.

307. Defense in Jungles

a. In light jungles, the principles of defense in woods generally apply. Thorough and continuous ground reconnaissance is necessary, because the observation of security elements is restricted and air reconnaissance is often ineffective. Long range fires can seldom be employed.

b. In a dense jungle, troops are disposed along the forward edge of the battle area with minimum intervals between foxholes and no gaps between units. Security elements consist of small groups, dug in for all-round defense, to cover trails and other approaches to the position.

Section III. DESERT OPERATIONS

308. General

All deserts have certain characteristics—lack of water; absence of vegetation; large areas of sand; extreme temperature ranges; and brilliant sunlight. The terrain is not necessarily flat and level. There are hills, depressions, sand dunes, rocks, shale, and salt marshes, as well as great expanses of sand; however, these terrain features usually present, at most, only local obstacles to movement.

309. Effects of Desert

a. Camouflage. The lack of vegetation in the desert makes concealment of men and equipment difficult. Artificial means of camouflage are employed extensively, including protective painting for all vehicles. Maximum use is made of shadows in broken ground, dried-out stream beds (wadies), and sand dunes.

b. Mobility. As a rule it is easy to move in desert areas; therefore, the force that has the

greater mobility is the more effective. Movements are made normally for long distances, and speed of execution is essential. Maintaining direction during movements is difficult because of the absence of roads, trails, and landmarks. Navigational aids and dead reckoning are used to maintain direction.

c. Surprise. Visibility is often poor because of the absence of high ground for observation and the presence of blowing dust. Surprise is facilitated by the use of aggressive reconnaissance and security forces; speed of movement; and deception. Dummy positions, decoy movements, and the operation of false radio nets aid in deception. In open areas, a force can conceal its movements by moving at night or during dust storms. The glare of the sun, especially when it is low on the horizon, reduces visibility toward the sun; an attacker may gain surprise by moving with the sun at his back.

d. Security. Because of the lack of natural obstacles in the desert, all-round protection is necessary at all times. Units must be prepared to fight in any direction. Reconnaissance must extend for greater distances than normal. The lack of natural concealment increases the diffi-

culty of security against enemy air action. Dispersion and camouflage are used as passive means of defense against air attack, and active defensive measures employed fully. Since it is virtually impossible to conceal logistical installations from either ground or air observation, their security is best obtained through dispersion and through deception as to the nature of the installation. Increased emphasis must be placed on active defense of supply columns and logistical installations from ground attack.

310. Conduct of Desert Operations

a. Offensive Operations. In desert combat, emphasis is placed on maneuver because flanks are most accessible. Terrain favors envelopments and deep turning movements. Wide movements around an enemy flank can often be made without deception.

b. Defensive and Retrograde Operations. Defensive and retrograde operations are carried out as discussed in chapters 3, 8, and 9, taking into consideration the effects of the desert described in this section.

c. For additional information, see FM 31-25.

Section IV. OPERATIONS IN DEEP SNOW AND EXTREME COLD

311. General

a. Deep snow and extreme cold weather present many problems for armor operations. Special training must be conducted for individuals and units, including small unit and battalion training.

b. Leaders must supervise all activities and always set the example. In no other part of the world is the necessity for leadership more apparent than it is in that of deep snow and extreme cold.

c. For detailed discussion of operations in extreme cold, see FM 31-70, and FM 31-71.

312. Effects of Deep Snow and Extreme Cold

a. Troops require special clothing and heated shelters. Equipment and supplies that would be damaged by freezing are protected against the cold. Weapons and vehicles are winterized with special lubricants. Wheeled vehicles may

be used on established roads in rear areas. Full-track vehicles with low ground pressures are used for movement over snow-covered or muddy terrain. Movement on icy slopes often require special grousers fitted on the tracks.

b. All movement is slow. This frequently limits the depth of combat missions. Careful reconnaissance by patrols on skis, snowshoes, or light oversnow vehicles precedes movement of units. Reconnaissance reports include information on snow depth and ice thickness. Short range weather forecasts are important in planning movement.

c. Armor units advancing across country avoid heavy forests and deep drifts, taking advantage of windswept ridges where snow cover is thinnest. Thickly frozen lakes and rivers, instead of being obstacles, are good routes for movement.

d. In winter the short periods of daylight, and the difficulty of concealing movement in

snow-covered terrain, cause an increase in night movements, which are frequently aided by clear atmosphere and bright moonlight. Deep snow provides concealment, but increases the difficulty of orientation on the terrain. Long movements require the use of navigational aids.

Section V. MOUNTAIN OPERATIONS

314. General

Mountain combat may involve operations in areas of high altitudes subject to extreme changes in weather; snow-covered slopes much of the year, few roads most of which are narrow and twisting, and few if any communication centers. In general, operations in mountainous terrain retard and restrict maneuver, reduce the rate and effect of fire, and make communication and supply difficult. Mountain terrain and weather can be either a dangerous obstacle to operations or a valuable aid, according to how well it is understood and to what extent advantage is taken of its peculiar characteristics (FM 31-72).

315. Effect of Mountains

a. The nature of the terrain normally limits the use of armored vehicles to roads and trails. Tactical surprise may be achieved by employing varying degrees of engineer effort to permit tanks to move to advantageous firing positions in the roughest types of terrain.

b. Consideration should be given to obtaining information from local inhabitants of the area about trails and natural obstacles that often do not appear on military maps.

c. Adequate logistical support for armor units engaged in mountain operations is extremely difficult. Roads are usually few in number and require extensive maintenance. Helicopters may be used for supply operations.

d. Mountainous terrain presents many communication problems. Radio communication, particularly FM sets, may be affected by high ground between stations.

316. Offensive Operations

a. In mountainous terrain, an armor attack must be planned in detail and the troops briefed

313. Conduct of Operations in Deep Snow and Extreme Cold

a. *Offensive Operations.* Offensive operations are conducted as described in chapter 7.

b. *Defensive and Retrograde Operations.* Defensive and retrograde operations are conducted as described in chapters 8 and 9.

thoroughly. The terrain may permit tanks to support attacking infantry with relatively long range direct fire. This requires excellent radio communication and thorough coordination between the infantry and tank units.

b. Key terrain features are primary objectives. Attacks along low ground are usually costly because the defender has excellent observation. The route of an attacking force will normally be along ridge lines or on other elevated terrain. On such terrain, the attacking force will often gain tactical surprise. Extensive engineer work may be required to place tanks on high ground where they can closely support the attack. It may be necessary to build a trail from low ground to the attack position. When mountainous terrain contains corridors that are favorable to the attack and permit employment of armor, armor units may attack down the corridors while infantry units attack along the ridge lines.

c. Available roads and trails must be kept in good repair to permit the movement of armor. Tank dozers and bridging material must be kept well forward.

d. No more armored vehicles should be taken forward than are required for immediate operation. Having uncommitted armored vehicles in forward areas causes unnecessary damage to roads and may create traffic hazards for supply vehicles.

e. If decisive armor action becomes possible, armor forces are committed in mass, supported closely by artillery and engineers. Objectives are usually critical points on the hostile routes of supply and withdrawal, the capture of which would isolate the enemy forward position.

317. Defensive and Retrograde Operations

The fundamentals of defensive and retrograde operations discussed in chapters 8 and 9

are applicable to the conduct of the defense in mountain warfare. The use of armored vehicles may be limited. However, wherever possible,

full advantage is made of tanks in their anti-tank role and in offensive actions.

CHAPTER 12

OTHER OPERATIONS — MISSION TYPE

Section I. GENERAL

318. Description

The operations described in the following sections are normally conducted in conjunction with major operations, that is, attack, defense,

or retrograde. These operations evolve as a part of the overall mission of a unit, for example, an airmobile operation conducted in conjunction with an attack to seize crossing sites over a river.

Section II. AIRMOBILE OPERATIONS

319. General

The number of air vehicles in the armored division gives the division a capability to conduct airmobile operations to assist in the seizure of deep objectives. This capability increases the speed and flexibility of armor operations. Airmobile operations are not

limited to any particular type combat unit. However, mechanized infantry battalions and armored cavalry units of the armored division will participate most frequently in airmobile operations. For information on the planning for and execution of airmobile operations, see FM 57-35.

Section III. LINKUP OPERATIONS

320. Definition

A linkup operation is the convergence of two separate ground units and usually occurs in joint airborne, amphibious, shore-to-shore, airmobile, and infiltration operations; during the relief of an isolated unit; the breakout of an encircled force, or an attack to join a friendly guerrilla force.

321. Conduct of Linkup Operations

The initial phase of a linkup operation is conducted as any other offensive operation; however, as the linkup forces close the distance, coordination and control are intensified and restrictions are placed on the forces involved.

a. Planning. Plans for a linkup are coordinated in advance and must be timely. It is extremely important that the forces involved have an early and continuing exchange of information.

b. Command Relationship and Responsibilities. The headquarters directing the linkup

operation must establish the command relationships and responsibilities of the forces involved. Both the linkup force and the force with which linkup is to be made can remain under control of the directing headquarters, or either force may be attached to the other.

c. Command and Staff Liaison. Liaison is normally established during planning and continues throughout the operation. As the distance closes between the forces, additional liaison personnel are exchanged. Air vehicles facilitate and expedite this exchange.

d. Communication. The communication plan includes the channels for radio communication between the two forces. It must prescribe day and night identification procedures, including primary and alternate means. High-performance aircraft and air vehicles can be used to give signals or to otherwise extend communication. Visual signals such as flares or panels may be used during daylight, and flashlights or

infrared devices may be employed during darkness.

e. Mutual Recognition System. To preclude the possibility of friendly troops exchanging fires, recognition signals must be established. They may be pyrotechnics, armbands, vehicle markings, panels, colored smoke, distinctive light patterns, infrared signals, and passwords.

322. Linkup of a Moving Force with Stationary Force

a. General. In an operation where one force is moving to linkup with a stationary force, the following procedures are necessary.

b. Coordination of Ground Linkup Points. To insure that the forces join without doing battle against each other, linkup points are selected at which physical contact between the forces will occur. These points must be readily recognizable to both forces. Alternate points are selected in the event enemy activities cause linkup at places other than those planned. The number of linkup points selected depends upon the terrain and the number of routes used by the linkup force. All personnel involved in the linkup force must be thoroughly familiar with procedures for mutual identification and plans for the rapid passage of lines.

c. Fire Coordination Line. To prevent losses from fire by friendly forces, the fire coordina-

tion line is established to coordinate the fires delivered by both the linkup force and the stationary force. As linkup becomes imminent, one force may deliver fire outside the line only after coordinating with the affected friendly force.

d. Actions Following Linkup. When the linkup is effected, the linkup force may join the stationary force, or may pass through and continue the attack. If the linkup force is to continue operations in conjunction with the stationary force, a single commander for the overall force must be designated. Plans for these operations must be made in advance. If linkup is to be effected under conditions of nuclear warfare, objectives for the linkup force must provide for dispersion in relation to the stationary force. The linkup force may immediately pass through the perimeter of the stationary forces, be assigned objectives within the perimeter, or be assigned objectives outside the perimeter, depending upon its mission.

323. Linkup of Two Moving Forces

When two moving forces linkup, normally only suitable control measures, such as boundaries, fire coordination lines, and contact points where juncture is to be effected, are prescribed. When the linkup is accomplished, the units continue on their assigned missions.

Section IV. RAIDS

324. General

A raid is an attack to accomplish a specific purpose in enemy territory, with no intention of gaining or holding terrain. Raids are made normally to capture prisoners; to capture or destroy specific enemy materiel; to obtain information of enemy units, locations, dispositions, strength, intentions or methods of operation; or to disrupt his plans. Usually, raids are designed for tactical deception, inflicting loss or damage to specific enemy materiel, securing information, or supporting or coordinating with unconventional forces. Raids may be executed within or beyond supporting distance of the parent unit, in either daylight or darkness. When the area to be raided is beyond supporting distance, the raiding party

operates as a separate force. The raiding force always withdraws after it accomplishes its mission. Unless planned and executed carefully, the withdrawal is the most difficult part of the operation. Security is vital, because normally the raiding force penetrates the enemy position and is vulnerable to attack from all directions. Raids are planned and executed much like other attacks, but surprise and speed of execution are of greater importance (ch. 7). Raids may be conducted dismounted, motorized, mechanized, or by air or waterborne means. The tank sweep is suited ideally for raids (pars. 327-330).

325. Conduct of Raids

a. Selection of Raid Objectives. The raid objective may be prescribed by the higher com-

mander, or it may be left to the discretion of the commander of the raiding force. Where possible, the area selected for the raid is lightly defended. The raid objective accomplishes the mission of the raiding force.

b. Time of Raid. Before a raid, time should be allowed for reconnaissance, planning, registration of supporting fires, and rehearsals, preferably, raids are carried out so that the raiding force will arrive at the objective area at dawn or twilight, or other conditions of low visibility, to limit enemy observation and yet give enough light for close combat.

c. Route of Advance and Withdrawal for Raid.

- (1) In daylight raids, covered routes of approach should be used. The raid begins when the raiding force departs the last area or terrain feature held by friendly forces. Under conditions of reduced visibility when surprise through stealth is possible, advance and flank security detachments precede the raiding force. They prevent premature discovery of the raid by the early destruction of enemy security detachments.
- (2) The withdrawal usually is made over another route. Road intersections and other prominent landmarks are avoided. Security detachments and

protective fires are used to keep the routes of withdrawal open.

d. Rallying Points for Raids. Rallying points are locations at which units assemble when they have become separated during a raid or have completed their missions and are ready to withdraw. A rallying point is designated near the objective, and a series of rallying points may be prescribed along the routes of advance and withdrawal. A rallying point in an area controlled by friendly forces is usually prescribed to assemble materiel, prisoners, and information gathered in the raid.

326. Logistical Considerations in Raids

In planning logistical support of a raiding party, it must be realized that the raiding party may be isolated or required to fight its way back to friendly lines. Factors governing the amount of logistical support accompanying a raiding party include the type and number of vehicles and weapons; movement distance; length of time the raiding party will operate in enemy territory; and expected enemy resistance. Usually the raiding force carries everything required to sustain itself during the operation. Plans are made to supply a raiding unit, if required, by use of air vehicles as the primary means and by ground vehicles as an alternate means.

Section V. TANK SWEEPS

327. General

The tank sweep is an offensive operation designed to deliver a rapid, violent attack against an enemy force to inflict maximum casualties, disrupt control, and destroy equipment. It may be employed to achieve such objectives of a reconnaissance in force as are compatible with the conduct of the sweep.

328. Planning the Tank Sweep

a. The tank sweep is planned as a mounted assault through enemy-controlled territory. Planning is essentially the same as for any offensive operation except that no attempt is made to seize an objective. The tank sweep passes through the enemy and returns to friendly positions in a single move.

b. The tank sweep may be controlled more closely than other offensive operations. The extent of control may vary from a direction of attack to an axis of advance, depending upon the purpose of the sweep and factors of METT. Control measures are used to preclude friendly units firing into each other and to coordinate supporting fires.

c. The force conducting the tank sweep should be predominately a tank unit. Small mechanized infantry units may be attached for specific tasks, such as guarding and evacuating enemy prisoners or demolishing specific material during a sweep.

d. The selection of the area through which the sweep is to be conducted depends upon the purpose of the sweep.

(1) When the tank sweep is used to extricate a heavily engaged unit, it is planned in an area that enables the attacking force to strike the enemy flank immediately in rear of the line of contact.

(2) When the tank sweep is used to achieve certain directives usually associated with a reconnaissance in force, it is planned in an area that will satisfy the need for information.

e. Combat support is provided where necessary. Indirect fires from units already in position are planned in and along the flanks of the area to be swept. If weather conditions permit, smoke may be planned to add to enemy confusion and to assist in concealing the strength of the force conducting the sweep. Engineer tasks that can be accomplished rapidly, such as demolition of roadblocks or the expeditious breaching of a minefield, may require the attachment of engineer forces. Such tasks are planned carefully and coordinated closely to avoid slowing the sweep.

329. Conduct of the Tank Sweep

a. The commander of the attacking force employs a formation that permits the rapid delivery of heavy volumes of fire in the direction of the sweep. While the commander is alert to adapt the formation to the situation, he avoids changes that require any part of the force to halt. He adopts as wide a formation as the analysis of the factors of METT indicates to accomplish the following:

- (1) Gain information of the enemy from as wide an area as possible.
- (2) Inflict casualties and damage on as many enemy units and installations as possible.

(3) Insure that the force executing the sweep has a time-length that permits passage of dangerous areas as rapidly as possible.

b. Units keep moving and fire on enemy units and installations as they appear. Enemy tanks and armored vehicles are taken under fire with appropriate AP ammunition. Light vehicles, CP's, and supplies are destroyed by machine-gun and HE fire. Enemy infantry forces and weapons with exposed crews are machine-gunned and physically overrun. Enemy forces discovered in march formation or only partially deployed are assaulted immediately. The combination of heavy fire and rapid maneuvering into and through enemy units generates the necessary shock effect to maintain the momentum of the tank sweep.

c. If immediate evacuation is impossible, tanks that become damaged or otherwise immobilized are destroyed to avoid their capture. Crews of destroyed vehicles are evacuated. Armored personnel carriers from attached mechanized infantry units may accompany each tank platoon to evacuate crews and casualties from destroyed tanks.

d. Supporting fires are primarily preplanned and on call. Fire support units, when not firing, re-lay their weapons to keep pace with the sweep.

330. The Return to Friendly Positions

The return to friendly positions is a critical part of the tank sweep. As the sweeping force closes into friendly positions, close control and coordination are required to identify units; avoid obstacles; and prevent firing on friendly forces. These details are planned before the conduct of the sweep. See paragraphs 271 and 272 for techniques in planning and conducting a withdrawal through friendly positions.

Section VI. OPERATIONS IN FORESTS OR WOODED AREAS

331. General

a. The attack of a forested area is best suited for an infantry-heavy force. Heavily wooded areas, like builtup areas, restrict mobility, limited visibility and fields of fire, and increase problems of control. Fighting in

forests is characterized by many small unit actions. As a result, attacks in forests require detailed planning and control measures, decentralized control, and thorough briefing of subordinate commanders. Whenever possible, tanks avoid combat in forested areas. They

are better employed to bring direct fire on positions located on the outer edges and to encircle the defended wooded area. Whenever combat in woods is unavoidable, dismounted infantry are essential for the protection of armored vehicles. The attack in forests is divided into three phases—

- (1) Attack and occupation of the near edge.
- (2) Advance through the forests.
- (3) Exits from the forests.

b. Detailed planning and careful coordination of all the arms and services involved extend down to every member of the tank crews and of the rifle squads supporting them. Communication and target designation are especially important. It is necessary to plan supporting fires from artillery and infantry weapons as well as from the organic battalion support weapons, and to arrange with the engineers for route clearance or improvements. Tank dozers may be used to advantage. In nuclear warfare, consideration must be given to tree blowdown and fires that may occur in the attack area as a result of friendly nuclear strikes. Similar consideration must be given to enemy nuclear capabilities and the resultant obstacles to tank movement that could result.

332. Attack of the Near Edge of the Forests

a. The attack of a defended area near the edge of the forests is similar to the attack of any organized area. The near edge, or a terrain feature in which the near edge is included, is designated as the objective. When the attack must cover ground entirely exposed to enemy observation and fire, it may be made under the concealment of smoke or darkness. The methods of attack used are the same as in the attack of an organized position.

b. When a foothold has been established in the forests, the assault echelon consolidates and reorganizes. Distances and intervals between smaller units and supporting weapons are reduced so that contact can be maintained during the advance through the forests. Since the edge of the forests is a good target for hostile artillery and aviation, the consolidation and reorganization must be rapid.

333. Advance Through the Forests

a. The actual tactics employed must be designed to overcome the weapons and tactics of the enemy. Tanks move slowly, at short intervals and distances, to facilitate control and contact and to insure mutual support. In heavily forested areas, there are frequent halts for reorganization, supply, and orientation. Consumption of fuel and ammunition is heavy.

b. Figure 24 shows a typical formation of a tank platoon advancing with dismounted infantry along a trail in a forested area. The two leading tanks are echeloned to the right and left of the trail. Dismounted infantry accompany each tank. This formation presents a smaller target to the enemy and provides mutual fire support for each tank. The following three tanks proceed along the trail ready to support the leading tanks. The team of combined arms advances together, infantry maintaining close visual contact with the leading tanks; locating targets for the tanks; and providing security for the tanks by destroying infantry type targets.

c. Though forested areas often severely limit maneuver, the possibility of flanking action or flanking fire by the tanks is always considered. The more difficult the terrain, the greater the surprise obtained if a tank attack can be launched successfully across it. The infantry must never let the leading tanks advance out of sight. If this happens, the tanks may be knocked out by tank killer teams and antitank guns and the infantry subsequently stopped by machinegun fire. Proper coordination of effort will prevent the enemy from separating tanks and infantry (fig. 25).

d. The infantry indicate targets by using tracer ammunition, the external tank interphone, or prearranged signals.

e. Supply is a serious problem because of the large quantities of fuel and ammunition consumed and the difficulty of getting supplies forward. Consequently, maintenance and supply personnel must operate immediately behind the attacking elements. It may be necessary to establish an advance supply point at company level.

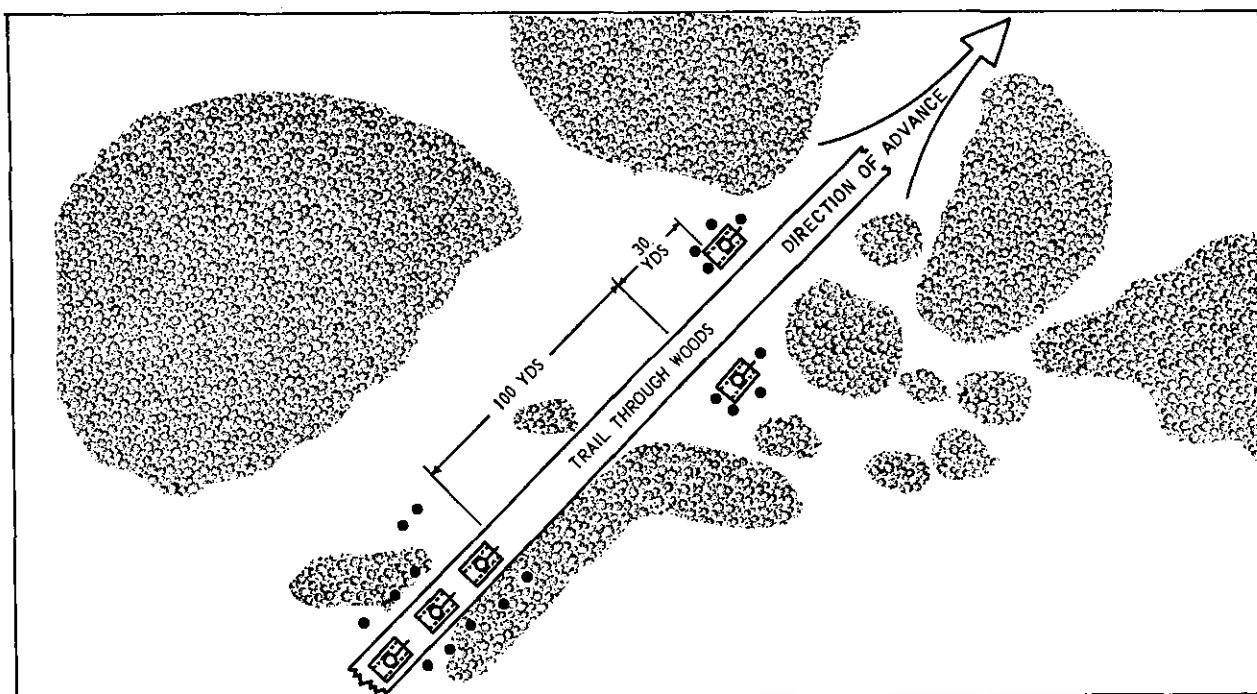


Figure 24. Tank-mechanized infantry formation in sparsely forested area.



Figure 25. Tank-infantry formation in wooded areas.

334. Security

Security is of the utmost importance in operations in forested areas, where surprise, ambush, sniping, and infiltration tactics are employed constantly. Whenever an attacking tank-infantry element halts immediate provision must be made for all-round security. When time permits an all-round defense system is established behind mines, boobytraps, and barbed wire, and is covered by an outer ring of dismounted infantrymen. Logistical elements should be located in the center of the perimeter defense for maximum protection.

335. Exit

The continuation of the attack from the far

edge of the forest is conducted like any other attack. Plans are usually made to reorganize the assault echelon before it reaches the far edge, especially when strong enemy resistance is expected after the forests are cleared. Units and supporting weapons are redispersed, and frontages, zones of action, and the formation of the unit are rearranged as necessary. New objectives are assigned; if possible, they are terrain features whose capture will mask the far edge of the forests from hostile ground observation and direct fire. When practicable, supporting weapons are given general-support missions. Artillery and mortar fires and smoke are planned to assist the exit.

Section VII. OPERATIONS AT DEFILES

336. General

a. Although armor units prefer to attack and maneuver on as broad a front as is tactically feasible, there are occasions when deployment may be constricted to negotiate a defile. In these instances, commanders and staffs must be alert to foresee areas where defiles may interfere with operations or constrict maneuver. When defiles are detected, plans must insure that troops are not compressed; that traffic is rigidly controlled; areas for dispersion of vehicles, equipment, and personnel are selected; and the passage of the defile is accomplished in minimal time. Every effort must be made to secure the flanks of a defile before attempting to pass the main body through the defile. Organic and attached air vehicles may be employed to perform reconnaissance and surveillance of critical areas and to transport light elements in the air-landed seizure of such areas.

b. The following definitions are necessary to the understanding of this section:

- (1) A *defile* is any terrain feature, natural or artificial, that tends to constrict the passage of troops. Examples are mountain passes, gaps through minefields, river-crossing sites, or bridges.
- (2) A *target zone* is a generally circular area centered on and encompassing a defile within which personnel would become casualties and equipment

would be destroyed or severely damaged by the effects of a selected enemy nuclear weapon.

- (3) A *defile target zone coordinator* is an individual designated by the commander to plan and regulate traffic flow through the defile target zone. This individual is normally the S3 when the traffic passing through the defile target zone consists primarily of combat and combat support units, and the S4 when the traffic is predominantly combat service support. The defile target zone coordinator exercises absolute control of traffic moving through the target zone.
- (4) *Holding areas* are waiting spaces for vehicles located on both the near and far side of the target zone. These areas are far enough from the defile to insure against loss of vehicles and personnel from blast and thermal effects of an expected enemy nuclear weapon directed at the defile site. The areas may be large enough to accommodate battalion-size units but are preferably company-size and should be occupied for a minimal time to avoid creating a lucrative target.
- (5) *Traffic control points* are critical locations at which traffic is controlled, either by military police or other per-

sonnel. Traffic control points operate under direct control of the defile target zone coordinator.

- (6) *Equipment parks* are small, well-camouflaged areas located near the defile for the central assembly of vehicles, equipment, and materiel for engineers' use during the defile operation.

337. Planning

a. Control. Control measures are planned in advance and employed to insure successful passage of a defile. The following control measures and techniques are essential:

- (1) Establish the limits of the target zone. This is actually a "vulnerability circle" encompassing a defile within which forces may be subjected to the maximum effects of an enemy nuclear strike.
- (2) Designate defile target zone coordinator.

- (3) Designate routes, including alternate routes for movement.
- (4) Establish traffic control points.
- (5) Select and establish well-dispersed holding areas.
- (6) Select and establish equipment parks.
- (7) Establish and maintain all feasible means of communication among the defile target zone coordinator, the traffic control points, stationed wreckers, and the engineers at the points of construction, such as bridge site, mountain pass.
- (8) Provide the defile target zone coordinator with adequate traffic control personnel, communication equipment and personnel, engineers and engineer equipment, wreckers, and security units.
- (9) Figure 26 depicts the control measures described in (1) through (8) above.

b. Conduct of the Passage.

- (1) Forces must move into, through, and disperse beyond the target zone with

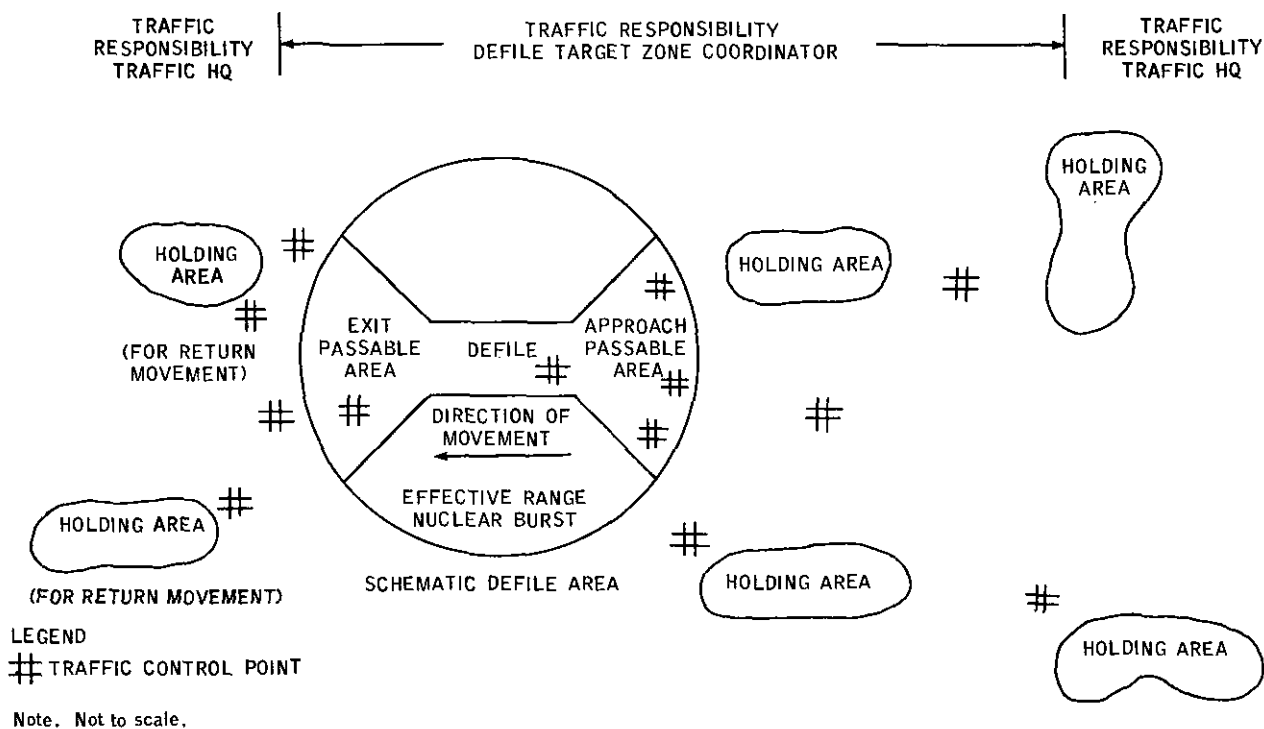


Figure 26. Control measures in defile operations.

great speed. Responsibilities for traffic regulation and control must be defined clearly. Engineer support required to prepare the defile site for passage should be accomplished under conditions of reduced visibility or at night, when practicable. The defile target zone coordinator is completely responsible for planning, regulating, and controlling traffic into, through, and beyond the target zone. He establishes priorities for movement; schedule of movement; rates of march; size of march units; and input of traffic into the target zone. Traffic regulation must be enforced rigidly to insure smooth, constant flow and prevent disruption.

- (2) To assist the defile target coordinator a traffic control headquarters is established and controls—
 - (a) Movement of traffic into holding areas on the near side of the target zone.
 - (b) Movement from holding areas (if used) on the far side of the target zone.
 - (c) Normal movement beyond holding areas on the far side of the target zone.
- (3) To facilitate rapid movement of traffic through the target zone, the defile target zone coordinator establishes traffic control points between the holding areas and the perimeter of the target zone, within the target zone, and beyond the target zone up to holding areas on the far side. Wreckers should be stationed at critical points along all routes, including alternate routes, and preferably rear traffic control points, to be immediately available. The engineer must have at his immediate disposal equipment and materiel, located in equipment parks, necessary to reduce obstructions to free-moving traffic. Communication must be maintained among the defile target zone coordinator, wreckers, the traffic control points, the engineer at the defile site, the military police or

other traffic control personnel, the traffic headquarters (at division level), and holding areas.

c. Alternate Routes. In the planning for a passage of a defile, alternate routes must be designated. Alternate routes should take advantage of concealed approaches to and through the target zone if possible. The negotiation of the defile by combat units should not be dependent exclusively on roads. All routes must be reconnoitered and made suitable for the anticipated volume of traffic.

d. Deception. Adequate deception measures must be planned to further the success of the main defile passage operation. Dummy equipment should be placed at selected defile sites to deceive the enemy and cause him to expend nuclear weapons on this site.

e. Retrograde Passages. The procedures established for the passage of a defile during the advance are equally applicable to retrograde movements. In fact, plans for a passage of a defile during the offense should encompass plans for a retrograde movement.

f. Use of Air Vehicles. Air vehicles may be used for airlifting certain troops, supplies, and equipment over or around the defile to reduce substantially the number of ground elements required to negotiate the target zone.

g. Security. Security units should be provided the defile target zone coordinator as a ready force to eliminate enemy countermeasures. Security outside the target zone remains the responsibility of the commander concerned. However, security plans must be coordinated.

h. Ground and Air Reconnaissance and Surveillance. In operations at a defile, reconnaissance and area surveillance are of utmost importance. It is imperative that the command be warned of the presence or approach of the enemy at the earliest possible moment and the longest ranges possible.

338. Brigade-Level Passages

Tactical considerations are shown in *a* and *b* below.

a. Offense. When the brigade must pass through a defile, armored cavalry elements should precede the main body and reconnoiter

the entire surrounding area. If the immediate area is clear, tanks and mechanized infantry are dispatched rapidly through the defile and establish a defense, securing enough maneuver room to permit the main body to emerge from the defile unhampered. If the area is defended, enough space must be seized for the main body to maneuver.

b. Defense. The defense of a defile by the brigade may be conducted using several methods:

- (1) Single position with flanks refused and protected by the obstacles forming the defile; the main body may be held in reserve behind the defile.

- (2) Delaying action, with leading elements well forward of the defile to gain time and space for the main body to pass the defile and deploy for any action required.

- (3) Mobile defense, with all major elements of the division forward of the defile.

339. Battalion or Task Force Passages

The procedures for battalion or task force passages are the same as described for the brigade (par. 338). Normally the battalion-size forces can readily bypass the defile if it is other than a mountain pass or a similar type terrain obstacle.

Section VIII. OPERATIONS AT RIVERS

340. General

In a river-crossing operation, the actual crossing is a means to extend the operation. Assault units cross first to establish a bridgehead on the far bank to protect the crossing of the remainder of the command. Whenever possible, the plans for the crossing of every river obstacle in the zone of maneuver should be prepared well in advance by appropriate command echelons. Prior planning affords the commander a greater opportunity to execute a crossing with speed, surprise, less vulnerability to nuclear attack, and usually less risk.

341. Types of Crossings

The two types of crossings are the hasty and the deliberate.

a. The hasty crossing is characterized by speed and surprise. This is the type preferred by armor units. Because of its speed and surprise, this type crossing is normally less vulnerable to nuclear attack and requires less concentration of personnel and equipment. Although the crossing is termed hasty, the situation that makes the crossing possible is often the result of detailed prior planning at higher echelons. This type crossing is feasible when the crossing areas are undefended or held lightly by the enemy and when mobile task forces are available to advance rapidly to the river line.

b. The deliberate crossing, in contrast to the hasty crossing, is characterized by more detailed planning at all levels, deliberate preparation, and the employment of more extensive crossing means. This type crossing is used when the area is defended strongly; the water obstacles is technically difficult; a hasty crossing has been unsuccessful; or the offensive is resumed at the river line. Detailed planning, extensive logistical preparation, and air and ground superiority are required. Overall planning and coordination are performed by corps or higher commands. Tank units are normally kept in mobile reserve and pass through the crossing area after the far shore has been neutralized.

342. Nature of a Crossing Operation

River-crossing operations are different in many ways from other types of ground maneuvers. The primary differences are—

a. There is a greater requirement for special equipment and specially trained personnel.

b. Command and control of units during a river-crossing are more difficult because of space, traffic, and communication restrictions and the involvement of units of many arms and services.

c. When amphibious and air vehicles are not available, or when long range nuclear weapons are not employed, the river itself may limit the

ability to maneuver and deliver effective supporting fires during the crossing.

d. Once forces and equipment are committed to the assault, withdrawal or deviation from the plan of action for the initial assault is extremely difficult.

343. Crossing Means

Every available means is used to cross the maximum number of troops and equipment in the shortest possible time. The means organic to armor units are the armored personnel carrier and the air vehicle. The personnel carrier because of its swimming ability, and the air vehicle because of its airlift capability, may supplement the carry capacity of bridges and rafts by taking across high priority items. Supporting engineers may furnish or construct such additional crossing means as rafts, ferries, bridges, mobile assault bridges, and assault boats.

344. Timing of the Crossing

Whether a crossing is made in daylight or darkness depends on the need for concealment, state of training of troops, nature of the terrain, characteristics of the water obstacle, enemy disposition and capabilities (use of minefields on far bank, capability to mount air and tank attacks) and the need for speed. Specific actions that must be timed carefully to insure the success of the crossing are—

a. Movement of assaulting troops into attack positions as required.

b. Movement of reserve elements, including vehicles and armor into assembly areas.

c. Movement of engineer assault crossing craft and bridging equipment into equipment parks.

d. Establishment of forward dumps of ammunition, gasoline, and high priority supplies.

e. Use of smoke (if required).

f. Feints, demonstrations, and other deceptive measures.

g. Preparatory fires.

h. Artificial illumination (if required).

i. Loading and departure of transport aircraft.

345. Desirable Crossing Site Characteristics

In the selection of crossing fronts, crossing areas, and crossing sites, both the technical and tactical requirements must be considered and evaluated. The crossing should be planned for execution on a wide front with several attacks at separated localities to deny the defender the capability of massing his fires or his counter-attack on more than one of these localities. The following desirable site characteristics are sought in river-crossing operations.

a. Assault crossing site should include—

- (1) A shoreline held lightly or undefended by the enemy.
- (2) Ready access to a good avenue of approach to objectives on the far shore.
- (3) Dominating ground on near shore for artillery observation and for support by direct fire.
- (4) A salient in the river line toward the attacker of such size and configuration its use can be denied the enemy by fire. Use of such an area may facilitate a crossing without being subjected to intense direct fires of the enemy.
- (5) Covered approaches to the river.
- (6) Existing routes leading to sites capable of handling amphibious type vehicles, or easily constructed access routes from existing road net to the site.
- (7) Moderate current.
- (8) Unobstructed water area.
- (9) Suitable banks for entry and exit of amphibious vehicles.
- (10) Straight stretch of river avoiding sharp bends where current is accelerated.

b. Amphibious vehicle crossing site should include—

- (1) Availability of suitable entrances and exits to and from the river.
- (2) Stream current not exceeding 5 miles per hour.
- (3) Gentle gradient with a firm bottom for entering or leaving the water.
- (4) Landing places wide enough to allow amphibious vehicles to land even

though subjected to the lateral force of the stream current.

c. Raft or ferry sites should include—

- (1) Short, easily constructed, access and egress roads from existing road net to and from the site.
- (2) A gentle current near each bank. Location of site in a straight reach of river.
- (3) Streambed free from ledges, rocks, shoals, islands, sandbars, and other obstructions that would prevent or hinder crossings.
- (4) Banks not so high or steep as to require excessive grading for approach. The water close to the bank should be deep enough to float a loaded raft or ferry without grounding.
- (5) Cover and concealment on both shores for vehicles or personnel waiting to be loaded or unloaded.

d. Floating bridge sites should include—

- (1) Short, easily constructed approach roads to existing road nets on both shores.
- (2) Firm stream banks.
- (3) Moderate stream current parallel generally to the banks.
- (4) Stream bottoms in which anchors will hold but not foul.

346. Conduct of Assault River Crossings

a. During the movement to the river, the commander deploys his force with the necessary means readily available for the anticipated crossing. He advances on a broad front with speed and violence in an attempt to seize bridges intact before the enemy can destroy them. This is an economical means of crossing a water obstacle and should be attempted whenever possible. Employment of assault air vehicles in conjunction with surface operations may be used to a great advantage. Simultaneously, airlanded forces on the far shore may be used to neutralize the enemy guarding the crossing area. Often a bridge partly demolished can be repaired by the supporting engineers. During this period the crossing units are moving from rear assembly areas up to the river line. Patrols clear the near shore crossing sites of

mines and other obstacles. The movement is so timed that the crossing unit using personnel carriers does not pause at the river line but moves through into the water. Airmobile forces, including engineers, can be landed on the far shore to clear or improve the egress sites. Engineer bridging equipment, rafts and bridges, is assembled and launched. Throughout this action supporting fires have been either lifted or shifted to deeper targets. As soon as the engineer bridging, including rafts, is completed, the remaining vehicles and personnel cross. The tactical situation will decide how far the units on the far shore will advance. Units must be prepared for enemy counterattacks or to continue the attack upon order.

b. Armor units should take advantage of their speed and mobility to make hasty crossings whenever possible. These crossings generally can be divided into three groups—

- (1) Seizing crossing means (primarily bridges) intact.
- (2) Forcing crossings at fords against light or poorly organized defenses.
- (3) Forcing crossings of lightly defended streams with the assistance of mechanized infantry and engineers.

Mechanized infantry and engineers closely follow the tanks; the engineers remove or neutralize any demolitions found on the bridge, and the mechanized infantry assist in seizing and defending it. When a ford must be improved before tanks can cross, mechanized infantry may have to establish a bridgehead on the far bank to protect engineers doing pioneer work.

347. Employment of Mechanized Infantry in River Crossing

Mechanized infantry is suited ideally for a hasty river crossing, due to the amphibious nature of the armored personnel carriers. For a discussion of the armored personnel carrier in river-crossing operations, see paragraph 352. A hasty river crossing is executed as any other attack, with minor differences or points of emphasis, discussed below.

a. Reconnaissance. This includes determination of the best crossing sites, locations of ford, steepness and condition of banks on both

shores, and speed of current flow. Other information sought is the same as for a normal attack.

b. Fire Support. Maximum fire support is brought to bear against known and suspected enemy positions on the far shore. Smoke is often employed to screen the crossing, particularly on the flanks. Tanks support the crossing with direct fire.

c. Preparation for the Assault. The pre-crossing procedures outlined in paragraph 352 are completed for each carrier. Life preservers are worn by crewmembers.

d. Speed of Execution. The total elapsed time between approach to the river line and the crossing must be held to a minimum to insure success. Once started, the crossing is completed with speed.

e. Formations. Formations depend on the availability of crossing sites and of fire support. The crossing should be made in waves, preferably formed by platoons, each in line formation.

f. Action on Far Shore. Should the steepness or condition of the banks on the far shore not permit the armored personnel carriers to leave the water, they are held against the banks while their squads dismount through the top hatches and move onto the shore. Armored personnel carriers may be used to ferry across other troops, ammunition, and fuel and lubricants.

348. Employment of Tanks in the Attack of a River Line

a. General. Tanks participate usually in an attack of a river line as a part of a combined-arms team. The greater part of the available tank units are held in reserve until a satisfactory bridgehead is established on the far bank. Other tank units may be assigned the mission of direct-fire support of the mechanized infantry crossing.

b. Fire Support. Reconnaissance must be made to determine the best positions from which tank fire support can be delivered. Tanks are brought forward by covered routes to defiladed or dug-in positions. Alternate positions are prepared as required. Positive arrange-

ments for control of the fire must be made with the units being supported, so that the tank fires may be lifted, shifted, or stopped in a manner similar to that of artillery and mortar fires. When employed in such a role, tanks must be supplied with ammunition in excess of their normal loads so that all tanks, when later employed across the river, will have full loads of ammunition.

c. Movement Into the Bridgehead. As soon as the infantry have gained a foothold on the far bank, tank units are ferried across to aid in enlarging the bridgehead and defending it against hostile armor. In nuclear warfare, overconcentration of troops on the bridgehead area must be avoided, to prevent presenting a lucrative target to the enemy. However, because tank ferrying requires the same equipment used in the floating bridge, ferrying over small streams is unusual.

349. Expansion and Exploitation of a Bridgehead

Any bridgehead must be expanded quickly and secured to protect the bridge site and permit assembly of forces in the bridgehead area. The initial security and expansion of the bridgehead are normally accomplished by mechanized infantry, with tanks supporting by direct fire from across the stream until they can cross.

350. Capabilities of Supporting Engineer Equipment

Engineers use assault boats, rafts, and bridges formed by connecting units of the mobile assault bridge together to form the desired vehicle. Additional equipment may be furnished by corps and army engineer units. Depending on the size of the operation, this would vary from the small, light footbridge to the heavy vehicular bridges capable of carrying division loads. Air vehicles may be used to assist in the assembly of these bridges by delivering prefabricated components directly to the waterline.

351. Expedient Crossing Means

Many expedient means or methods to cross personnel and equipment may be employed us-

ing organic equipment or that furnished from the rear support units. Listed below are some common field expedients; only time, personnel available, and the tactical situation restrict the initiative and ingenuity of the small unit commander in his employment of these or other means.

a. Using Organic Equipment.

- (1) If a marshy shoreline exists at the entrance site, the armored vehicle launched bridge (AVLB) may be laid across this area from firm ground into the water. The carriers may then cross over and begin swimming as they enter the water.
- (2) If the armored personnel carrier cannot climb out of the stream on the far bank, it should be backed up to the bank, the ramp lowered, and the personnel discharged. If the water is too deep to lower the door, personnel may have to exit from the top hatch.

b. Using Supporting Engineer Equipment.

- (1) Bridging equipment from corps and army units, when required, may be prefabricated in the rear area and delivered by air vehicle to the work parties at the shoreline.
- (2) For an expedient raft, the AVLB may be laid across floats and lashed securely. When an AVLB is used in such a manner, the bridge must be recovered as soon as other conventional military ferries are in operation.

352. Employment of Armored Personnel Carriers in Hasty River-Crossing Operations

a. Precrossing Considerations. Upon reaching a water obstacle, the armor unit commander, to minimize delay, follows a definite sequence or checklist before employing his armored personnel carriers. This sequence is—

- (1) Determine the velocity of the stream and its characteristics.
- (2) Determine bank conditions at the entrance to the stream.

- (3) Select landing points on the far shore and determine bank conditions at these points.
- (4) Insure that the carriers are checked properly before they enter the water and upon leaving the water.

b. Stream Velocity. The maximum stream velocity in which the carrier can be operated safely depends on such factors as the choppi-ness of the water, the amount of debris or ice in the water, and the maximum acceptable downstream drift distance. When the rate of flow is greater than 4 miles per hour, particular attention must be given to drift distance, balance of load, entry into the water, and ability of drivers. A simple way to determine the stream velocity is to use a floating device over a measured distance. Measure a distance of at least 100 feet along the near riverbank. Designate the upstream end as point A and the downstream end as point B. At point A, throw into the fastest part of the stream any object that will float, such as a piece of wood or cork. Using a stopwatch or the second hand of a watch, determine the time it takes the floating object to move from point A to point B (fig. 27). For example, if it takes 20 seconds for the object to float 100 feet, the rate of flow of the stream is 5 feet per second. This figure in feet per second must then be converted to miles per hour. This is done by using the conversion chart shown in figure 28. At least two tests should be made with floating objects, the average time being used to determine the rate of flow in feet per second. For additional information on water operations with vehicles see TM 21-306.

c. Stream Characteristics.

- (1) *Changes in velocity.* A sluggish stream or river may become a torrent in a few hours or even minutes as a result of sudden heavy rainfall. This is more likely to happen in tropical and arid regions. Stream velocities must be checked at frequent intervals to provide warning of such changes.
- (2) *Channels.* Velocities may vary in different parts of a stream. The rate of flow is usually slowest near the shore and fastest in the main channel.

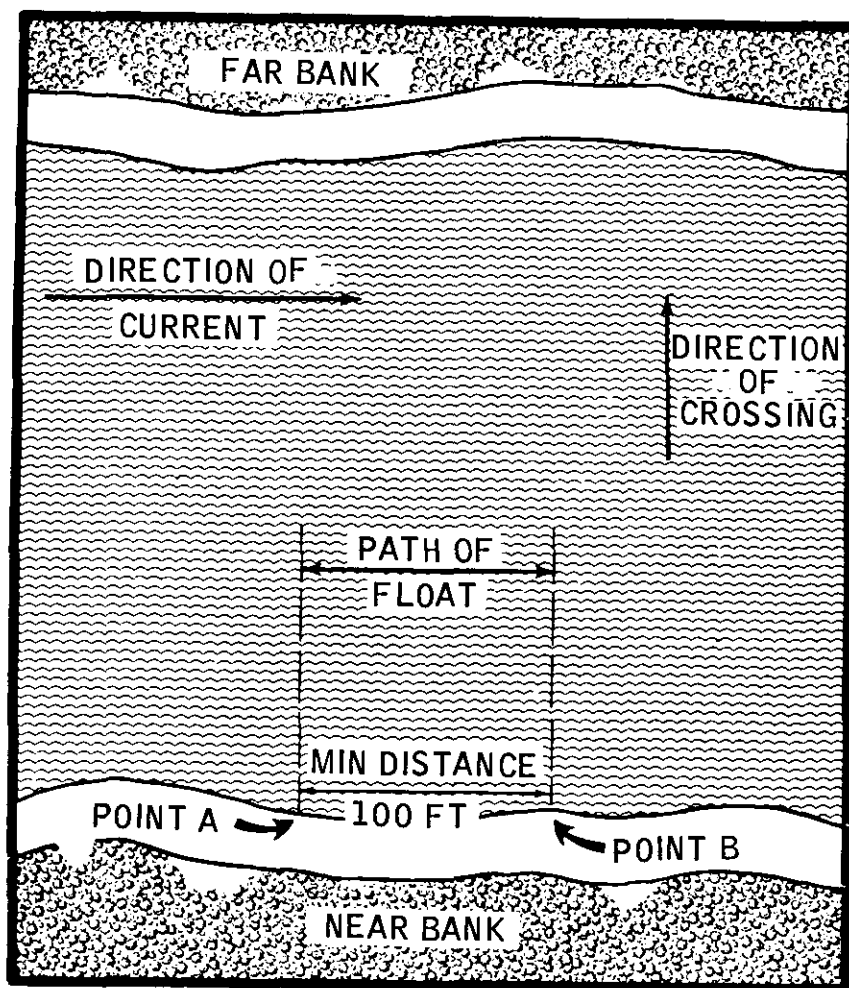


Figure 27. Float timing device over a measured distance.

- (3) *Debris.* Fast-moving streams often carry large quantities of logs, brush, and other debris. In cold climates, chunks of ice may be floating in a stream. Debris is a serious hazard to the armored personnel carrier; a single piece can foul a track and put the carrier out of control.

d. *Slope of Entrances and Exits.*

- (1) Gently sloping entrances and exits are desirable. However, even on the most gradual slopes, the armored personnel carrier must enter the water slowly

(approximately 2 miles per hour) to avoid a large bow wave. When descending steep banks, the vehicle will tend to dive unless the approach is slow enough to allow the bow to float.

- (2) The most common way to express slope is in percent (fig. 29). Thus, a 1 percent slope rises or descends 1 unit in a horizontal distance of 100 units; a 10 percent slope rises or descends 10 feet in 100 feet, or 10 yards in 100 yards, etc. The formula for percent slope is—

$$\frac{\text{VERTICAL DISTANCE}}{\text{HORIZONTAL DISTANCE}} \times 100 = \text{SLOPE IN PERCENT}$$

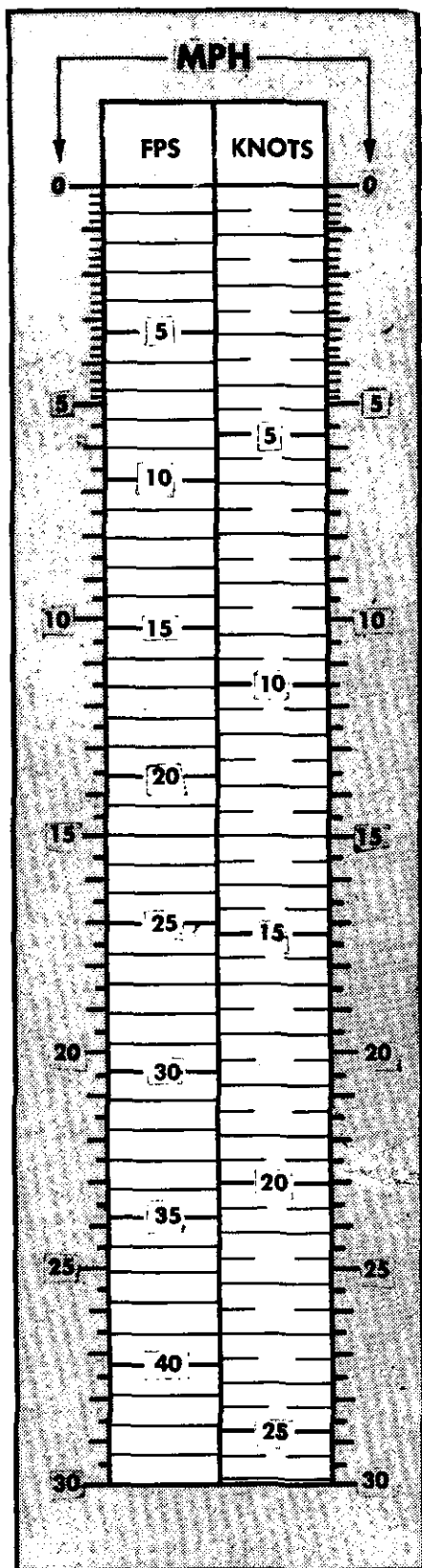


Figure 28. Chart for converting feet per second to miles per hour.

e. *Bank Conditions.* Banks can often be improved by use of pioneer tools or dozers. Corduroying (laying logs) can improve entrances into the water.

f. *Determining Landing Point on Far Bank.*

- (1) The bow of the armored personnel carrier is always pointed directly across the stream, perpendicular to the river current. The driver must not buck the current. The only time this rule does not hold true is when the speed of the carrier, in water, is *twice* the speed of the current. Then, the bow of the carrier may be pointed into the current, at an angle of not more than 30° in the direction of the flow. When the speed of the current and the speed of the carrier are the same, the carrier drifts 1 foot downstream for each foot it moves forward. When the speed of the current is twice that of the carrier, the carrier moves 2 feet downstream for each foot it moves forward.

- (2) A simple formula for determining the point of landing on the far bank is—

$$\frac{\text{STREAM VELOCITY (M.P.H.)}}{\text{SPEED OF CARRIER (M.P.H.)}} \times \text{DISTANCE ACROSS THE STREAM IN FEET} = \text{DISTANCE OF DOWNSTREAM DRIFT IN FEET}$$

For example, a carrier traveling at 4 miles per hour in a stream that has a velocity of 4 miles per hour and is 100 feet across will land 100 feet downstream from the point where it entered the water (fig. 30).

- (3) The maximum water speed of the armored personnel carrier is 4.3 miles per hour. When it is traveling at 4.3 miles per hour in water, the speedometer reading will be 12 miles per hour.

g. *Determining Formation and Priority of Crossing.*

- (1) The most important factors in determining the formation and priority for stream crossings are the mission, the

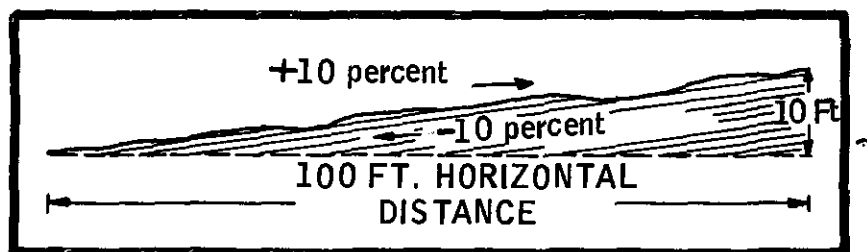


Figure 29. Expression of percent slope.

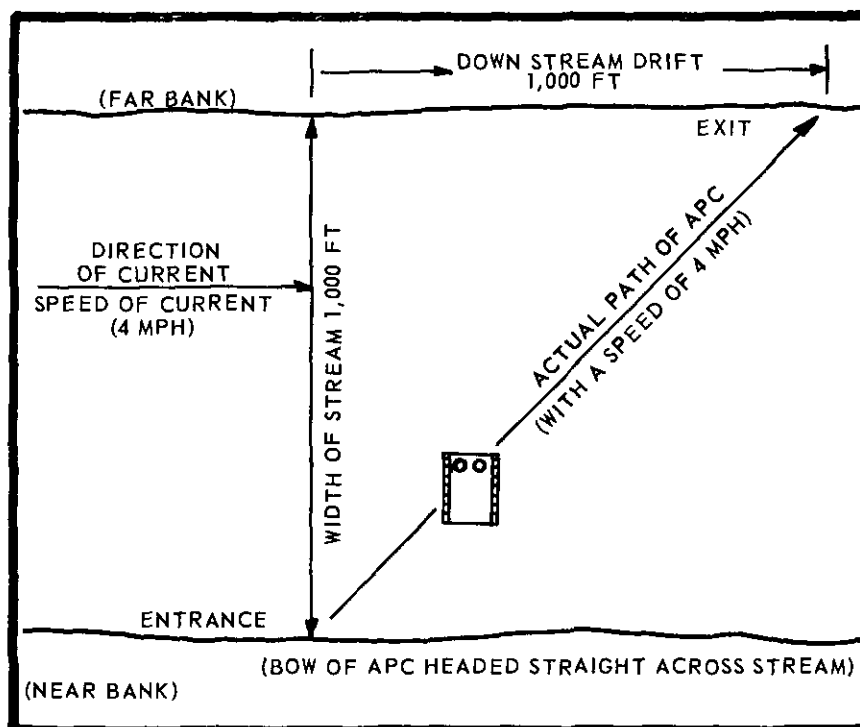


Figure 30. Downstream drift in a stream crossing.

number of entrances and exits, and the number of armored personnel carriers to cross. For example, if the mission requires a mechanized infantry unit to cross in one move, and there are enough entrances and exits, the best formation is an echelon—echelon left if the stream flows left to right, echelon right if the stream flows right to left. The carrier farthest downstream moves out first, followed by the one next farthest downstream, and so on; the carrier farthest upstream moves out last. This forma-

tion insures that upstream vehicles do not drift into downstream vehicles.

- (2) If the mission is ferrying, the greatest danger is collision. A collision may occur in 1 of 2 situations—the meeting situation and the passing situation.
- (3) When two carriers approach each other head on, each should turn to the right and pass the other vehicle on its left side. The turn should be started soon enough for each driver to be sure of what the other intends to do.

- (4) When one carrier overtakes another (this is not normal, but may happen when one vehicle is having trouble), it may pass the slower vehicle on either side, provided there is ample space. However, the vehicle being

overtaken has the right-of-way. The passing vehicle should cross the wake of the overtaken vehicle at any angle of at least 45° and should be sure to provide ample passing space.

Section IX. OPERATIONS AGAINST FORTIFIED POSITIONS

353. General

The attack of a fortified area is made by a combined-arms assault force consisting of tanks, mechanized infantry, field artillery, engineers, and tactical air when available. Special items of equipment and ammunition may be required. FM 31-50 covers in detail the attack of fortifications.

354. Effects of Fortified Positions

a. Reconnaissance of Fortified Positions. A thorough estimate of the situation, and detailed plans and orders, are essential in an attack against a fortified position. The estimate is based on an extensive reconnaissance. The reconnaissance starts with a preliminary map and airphoto study, after which all commanders make extensive personal reconnaissance. Observation posts, patrols, interrogation of civilians, and Army air vehicles are used to gain information. The reconnaissance seeks information on—

- (1) Location of fortifications, such as pillboxes.
- (2) Location of obstacles, such as minefields, wire, and trenches.
- (3) Details of fortifications—embrasures, thickness of concrete and steel, entrances and exits, underground organization, etc.
- (4) Location and type of enemy weapons.
- (5) Defiladed approaches to the position.
- (6) Positions from which direct-fire support can be furnished to the assaulting force.

b. Organization of the Assault Teams. The assault teams are normally built around mechanized rifle platoons with tanks supporting each team. The assault team is divided normally into 1 or 2 flank groups as needed, an assault group, and a support group. Each group may

have tanks in support. Each man and each vehicle on the team is given a special mission to perform. The teams must be allowed as much time as possible for rehearsals and reconnaissance. Normally, each team is assigned only one pillbox, bunker, or similar fortification at a time.

c. Employment of Tanks Against Fortifications. The tanks normally provide direct-fire support to the assault teams. They fire at embrasure openings and attempt to destroy the fortification. Tanks usually follow other elements of the team, but must be close enough to give direct support at all times. Tanks not attached to an assault team may give additional fire support from hull-down positions.

d. Employment of Flamethrowers Against Fortifications. Both portable and mechanized flamethrowers may be used in the assault teams. The flamethrower is an effective weapon for the last-minute, close-in protection of men placing breaching charges and for mopping up the fortification after it has been breached.

e. Use of Smoke Against Fortifications. Smoke may be used to screen the entire front, to cover the movement of troops into position, to screen one or both flanks of a gap created by unequal advance of units, to screen an area outside of the immediate action, or to blind observation posts and fortifications that cannot be neutralized by other weapons. Even though the attack is made during darkness, smoke may be valuable to counter the possible enemy use of illuminating flares and shells. The use of smoke must be coordinated, to insure that it will not interfere with the need for direct fire on fortifications and for ground observation by the assault teams. If conditions are at all favorable, every effort should be made to blind fortifications that can support those being attacked.

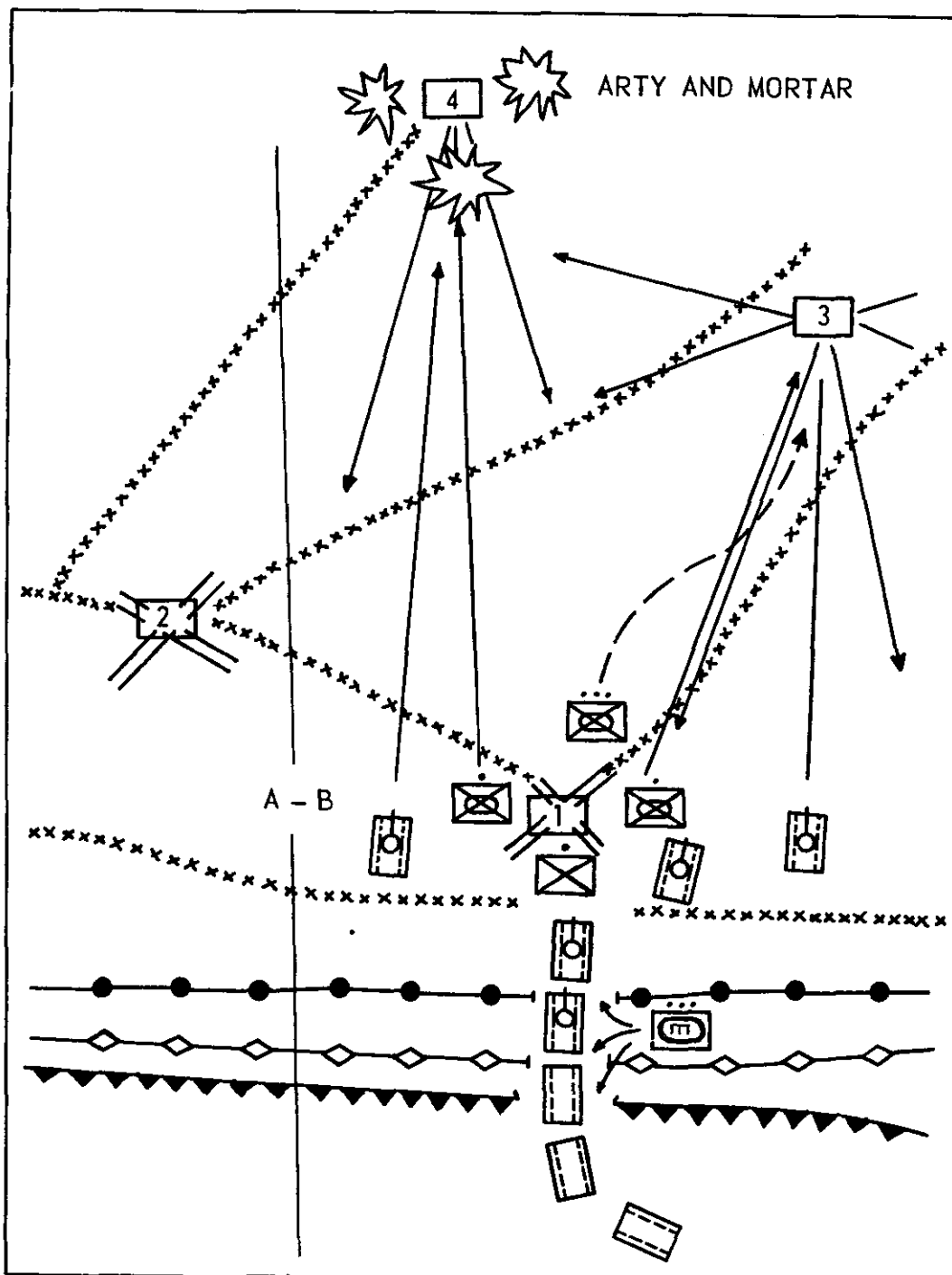


Figure 31. Assault of the objective.

f. Orders for Attack on Fortifications. Orders for an attack on a fortified position normally are issued in great detail. The attack on each bunker and defensive work is planned individually and is coordinated with attacks on adjacent fortifications. The order includes detailed instructions to each assault team, including positions, routes to be followed, time to open fire, types of fire to be used, areas in which teams may fire, and the general conduct and action of each team.

g. Use of Tank Dozers. In the initial phase of the attack, the tank dozer may be used to assist in reducing obstacles. As soon as the assault team closes on the fortification, the tank dozers are moved forward to be available to cover the openings of the fortification with dirt. This is an effective way of immobilizing any enemy troops who refuse to surrender.

h. Artillery Assault Fire. When the usual direct-fire means and supporting fires cannot neutralize an enemy fortification, self-propelled medium or heavy artillery may be used in an assault fire role.

i. Use of Nuclear Weapons. Extensively fortified areas present a difficult target for destruction by nuclear weapons. By careful selection of weapons and height of burst, however, severe damage can be created to permit exploitation by armor units without causing an unacceptable hazard from radioactive fallout.

355. Conduct of the Attack of Fortifications

a. The attack usually starts with intense artillery fire and with the laying of a smoke screen if conditions are favorable. Air bom-

bardment of the fortifications is also desirable. While the artillery is firing, routes are cleared of antipersonnel mines by use of grapnels or other means. Demolition snakes may be used to clear antitank mines. When paths have been cleared, the assault teams move forward as rapidly as possible (fig. 31), under the cover of supporting fires.

b. The flank groups direct their fire at any open emplacement on the flanks of the fortification. The tanks and machineguns of all groups fire at embrasures to keep them closed. If the fortification is protected by wire, a path through the wire must be made by wire-cutting parties, by tanks, or by bangalore torpedoes. If possible, the assault group advances over ground not covered by fire from the embrasures. The tank guns cease fire on signal of the assault team commander; and the machineguns, both tank and ground, cease fire when masked. Fire from the antitank rockets and flamethrowers, directed against embrasures, may be used by the assault group to assist in covering the advance of a demolition party at close range. Upon breaching the fortification, the assault group rushes the emplacement and, with hand grenades and portable flamethrowers, overcomes all enemy resistance. Flank and support groups move up and cover the reorganization of the team.

c. During the mopup stage, tanks are prepared to fire on probable avenues of enemy counterattacks. Tanks that have been supporting the attack by fire are moved forward to assist. Fresh teams are moved forward quickly to continue the attack without delay, and the process of deepening and widening the breach is continued.

Section X. OPERATIONS IN BUILT-UP AREAS

356. General

Armor units normally bypass built-up areas because combat operations are characterized by house-to-house fighting, restricted observation and fields of fire, restricted maneuver space for armored vehicles and extreme difficulty of control and coordination. As a result, combat in such areas consists of a series of small, predominantly mechanized infantry-heavy actions (FM 31-50).

357. Tactical Considerations

Basic tactical doctrine and fundamentals for operations in built-up areas are essentially the same as those prescribed in previous chapters and in FM 100-5. The nature of the environment reduces the speed with which armor units normally conduct operations. Planning must be in great detail and troops must be briefed carefully. The following factors must be con-

sidered in establishing the tactical procedures and techniques for this type of operation.

a. Characteristics of City Fighting Favorable to the Defender.

- (1) A well-organized and determined force located in the confines of a built-up area can hold off a superior attacking force for long periods of time. Strongly constructed cities give the defender a decided advantage over the attacker in that each building or group of buildings is a potential strongpoint. By additional construction, use of barricades, boobytrapping of areas in the buildings, and other means available to the defender, the buildings selected for defense become veritable fortresses.
- (2) The defender can select positions that maintain observation and fires on the approaches into the city.
- (3) The defender has a choice of buildings to defend. These buildings also provide cover and concealment. The attacker must determine which buildings are being defended and which are not. Adequate underground cover is usually available to the defender and gives him some protection against air and artillery bombardment.
- (4) Streets and alleys allow movement and constitute ready-made fire lanes and killing zones. Streets and alleys can be blocked easily by mines, boobytraps, barricades, and other obstacles. The attacking troops, by the nature of the area through which the attack must be conducted, will find their movement restricted and canalized.
- (5) The attacker will be limited in the employment of indirect-fire weapons because of restricted observation in the area, and the nearness of his own troops to enemy targets. Employment of direct-fire weapons is subjected to limited fields of fire.

b. Characteristics of City Fighting Favorable to the Attacker.

- (1) The attacker has the advantage of maneuver in isolating the city to be

seized. Once the isolation of the city has been completed, the attacker is in a position either to press the attack on the city or to contain it and force the defender eventually to capitulate.

- (2) Once the city has been isolated, the attacker may select his point of entry into the city. The attack may be conducted from any direction(s).
- (3) The attacker may be able to bypass strongly defended buildings in the city by going under them, using cellars, sewers, subways, or other underground passages. Other strongly held defensive positions may be bypassed by attacking over the roofs of the buildings.

c. Building Arrangement in Built-up Areas.
The construction patterns or building arrangements of a typical city are classified usually into three different categories:

- (1) On the outskirts or suburbs are found normally isolated houses or small groups of houses surrounded by small plots of land, gardens, farms, fields, or vacant lots. When this part of the city is attacked, the houses should be treated as inferior pillboxes or individual emplacements, and the plan of attack may be no different from that used in an attack over normal terrain where an occasional fortification is encountered.
- (2) The second type of building arrangement found usually is in the residential district, an intermediate area, where there are more closely spaced, detached, or semidetached houses, flanked by streets on one side and by gardens on grassy plots on the other. The general layout may or may not follow some geometrical pattern. The type of attack to be used in this area may vary and will depend upon the density of the buildings. A modified form of street fighting will probably be used, but basic techniques will remain the same.
- (3) The center of the built-up area is usually the business section and will al-

most always consist of buildings of block-type construction, with little or no space between buildings, except for an occasional park, street or alley. This type of construction will require fighting from building to building and block to block. This is the part of the built-up area where basic differences in techniques are required.

358. Plan of Attack

Plans for the attack and seizure of a well-defended city must be based on a detailed study of the city as well as the enemy dispositions in and around it. As in any other attack, planning must provide for a plan of maneuver and a plan of fire support. The attacking force may be composed of a mechanized infantry-heavy *direct-assault force* and a tank-heavy *enveloping force* (fig. 32). Both forces are supported by coordinated fires. The enveloping force has the mission of preventing the escape of the enemy, preventing reinforcements from entering the city, providing direct-fire support for the direct-assault force, and protecting the direct-assault force from counterattack. The direct-assault force has the mission of clearing the city of enemy resistance and linking up with the enveloping force. The attack is planned normally in three phases: in the first phase the city is isolated; in the second phase a foothold is gained on the near edge of the city; and in the third phase the area is systematically reduced.

359. Conduct of the Attack

a. Phase I. Phase I is the isolation of the city and the seizure of terrain features that dominate the approaches into it. The attacker secures positions outside the built-up area from which to support the entrance into the city itself. The tactics and techniques for this phase of the operation do not differ from those employed in an attack against other well-organized enemy positions.

b. Phase II. Phase II is an advance of the attacking forces to the edge of the built-up area and seizure of a foothold. It should insure the elimination of the defender's ground observation and direct fires on the approaches into the

built-up area. The attacker uses the foothold area to reorganize, decentralize control, and displace weapons to firing positions from which the continuation of the attack can be supported. The initial penetration is made on a narrow front with tanks leading. All available supporting fires are concentrated at the point selected for entry. Assaulting forces can expect to encounter barricades, antitank mines and obstacles, and effective antitank fire. The probabilities of success are increased if the assault is launched from an unexpected direction and preferably in the early morning just before first light, during other periods of limited visibility, or under the cover of smoke. To effect the penetration on a narrow front, a column formation is employed normally in the initial assault. The use of a column formation does not mean that all elements of the assaulting force should be in column. Several column formations may be employed by a commander conducting the assault. For example, a battalion task force may use a column with each of its company teams in line, wedge, or echelon. These formations tend to shorten the length of the task force column reducing the time necessary to move into the built-up area. Regardless of the formation employed, the leading elements of the assaulting force should use a formation that facilitates the delivery of maximum fire on the point of penetration. Engineers, mechanized flamethrowers, and mine-detection or mine-detonating tanks or vehicles (if available) should be included in the assaulting force. Artillery airbursts are placed over the point selected for entry to prevent the enemy from manning crew-served or individual antitank weapons. The mechanized infantry remain mounted and are carried as close to the objective as possible. In the attack of a strongly defended area, the mechanized infantry will have to dismount to assist in the assault of the outer defense and to provide close-in protection for the tanks. Designated fire teams or squads may be assigned to work with a particular tank. Direct communication between the rifle squad or fire team leader and tank commander is maintained by visual signals and external interphone. When operating dismounted, the mechanized infantry should remain to the rear of their assigned tanks to

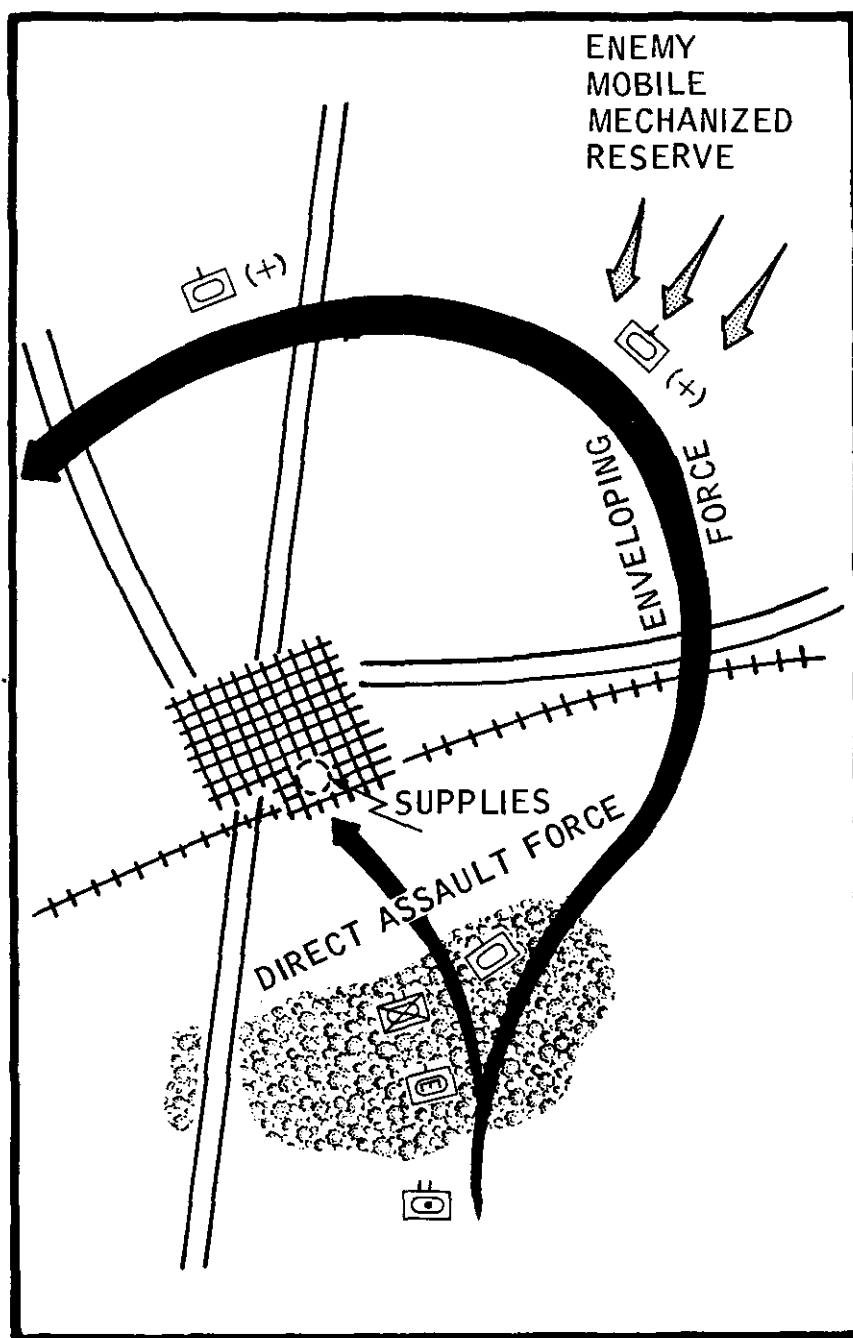


Figure 32. Coordinated attack against a town.

avoid masking their fires and to protect themselves from fires directed at the tanks. When it is necessary for the dismounted mechanized infantry to maneuver to engage or destroy resistance holding up the advance, the tanks support by fire, moving forward as soon as possible. The armored personnel carriers follow as closely as the situation permits behind the advance of the tanks and dismounted mechanized infantry. When possible, the fires of the armored personnel carriers' machineguns augment the other fires of the assault or cover critical areas on the flanks of the assaulting force. When the buildings on the periphery of a town are fortified heavily, the techniques for the attack of a fortified area may have to be employed (pars. 353-355).

c. Phase III. Phase III varies from a systematic block by block, house to house reduction of the built-up area to a rapid advance through the town with clearance of specific critical areas and strategic buildings. Phase III begins without pause after the completion of phase II. Clearance and seizure techniques are dependent upon the mission, size of the town, construction and building arrangement, and enemy dispositions and strength. Factors governing the selection and execution of the techniques are—

- (1) When the built-up area is exceedingly large and heavily fortified, or when the mission requires a complete clearance of enemy forces, a methodical house by house, block by block clearance operation is performed. The area is divided into company team zones of responsibility. Each subordinate unit must clear its zone completely, leaving no enemy in its rear. The procedure of street fighting is conducted in the same manner as described in FM 31-50.
- (2) When the built-up area is small or defended lightly, the attacking force should attempt to drive through or into the town as rapidly as possible. Tanks lead the column, closely followed and supported by mechanized infantry. Except when an advance is made on a wide street, it will rarely be possible to employ effectively more

than three tanks at the head of the column. The leading tanks are followed by the other two tanks of the tank platoon. The automatic weapons of the tanks and the vehicular machineguns of the carriers are fired continuously and are concentrated on the windows and rooftops of buildings. The mechanized infantry remain mounted in their carriers until forced to dismount to protect the tanks from individual or longer range antitank weapons. The mechanized infantry may dismount to assist in the removal of obstacles or barricades that have halted the advance of the tanks. When required to dismount to secure the tanks from fire being received from buildings, a rifle squad moves along each side of the street, keeping approximately abreast of the lead tanks. Depending upon the resistance being encountered, the squad may challenge every doorway or ground floor window by throwing in hand grenades and spraying the interior with small arms fire. Selected men in each squad should be assigned the mission of locating and engaging targets in the upper floor windows and rooftops of the building on the *opposite* side of the street. The leading tanks meanwhile continue to fire at suspected enemy locations farther down the street. When resistance is heavy, each alley or side street presents an ideal fire lane for enemy high-velocity tank or antitank fire, and should be crossed with caution. The mechanized infantry observe down alleys and side streets before the tanks cross, and emplace light machineguns on each corner, covering or firing in both directions. When a serious antitank threat to the column's flank exists, 1 or 2 tanks and a rifle squad with its carrier from the lead company team may be dropped off at each intersection along the route. If these forces are to remain in position until the entire force has

passed, the following company team assumes the lead in the advance when the original lead company team has been depleted; otherwise the following company teams may relieve these forces, permitting them to continue the advance with their company team.

360. Control Measures

The conduct of combat in built-up areas requires specific control measures, with which all troops must be familiar. Such measures include—

a. Boundaries. In order to provide easy and definite identification in denser portions of block-type areas, boundaries are placed along one side of the street with the street inclusive to one unit. In areas of semidetached construction where observation and movement are less restrictive, the boundaries may be placed in the alleys or within the blocks so that both sides of the street are included in one unit zone.

b. Objectives. Objectives are specific and limited. The assignment as objectives of major street intersections, principal buildings, or other readily identifiable physical features facilitates control. The numbering of the buildings along the route of attack simplifies the assignment of objectives and reporting. When assigning a street as an objective, always designate the near side as the objective. If the far side of the street is assigned, it will be necessary to hold buildings on both sides of the street to secure the objective. Units promptly report their seizure of objectives and continue the attack on order of the next higher commander.

c. Frontages, Formations, and Zones of Action.

- (1) Attacking battalions will normally be assigned relatively narrow zones of action. The frontages assigned will be dependent on enemy strength, size of the buildings, and resistance anticipated. Normally, a battalion task force will be assigned a frontage of from 3 to 6 blocks, which in turn will permit the assignment of a frontage to the attacking company teams of 1 to 2 blocks. Frontages assigned subordi-

nate units must be commensurate with their capabilities.

- (2) Formations, although influenced by frontages and zone of action, must provide for reserves. These forces should be well forward to add momentum to the attack, exploit success, repel counterattacks, and protect the flanks and rear against enemy action.

d. Phase Lines. Phase lines may be employed to further control by regulating the advance of attacking forces and delineating where, in the visualization of the commander, the command is expected to pass from one phase of the assault to another. Since phase lines are less restrictive than objectives, they provide for the rapid exploitation of success without halting. Principal streets, rivers, trolley lines, and railroad lines are appropriate for use as phase lines.

e. Checkpoints. Street corners, buildings, railway crossings, bridges, or any easily identifiable feature may be designated as check or contact points.

361. Mission of Mechanized Infantry in Street Fighting

a. Location of targets for engagement by tank weapons.

b. Neutralization and destruction of enemy antitank weapons.

c. Assault and reduction of positions, and clearance of buildings under the covering fire of tanks.

d. Protection of tanks against individual antitank measures.

e. Security and defense of the area once cleared.

362. Mission of Tanks in Street Fighting

a. Neutralization of enemy positions by machinegun fire to allow the mechanized infantry to close with and destroy the enemy.

b. Destruction of enemy strongpoints by appropriate tank fire.

c. Destruction of barricades across streets.

d. Forcing of entry for infantry into buildings when doorways are blocked by debris, obstacles, or enemy fire.

e. Taking under fire any other targets indicated by the mechanized infantry (fig. 33).

f. Establishment of roadblocks and barricades.

363. Employment of Attached and Supporting Units

a. Tanks.

(1) Streets and alleys constitute ready-made fire lanes and fixing zones. Vehicular traffic is greatly restricted and canalized and is subject to ambush and close-range fire. Tanks are at a further disadvantage because their main guns cannot be depressed or elevated enough to fire into the basements or upper floors of buildings at close range.

(2) When a platoon of tanks forms part of a company team, two tanks advance with the leading mechanized infantry. The remaining tanks support by overhead and flank main gun and machine-gun fire. At least a squad of mechanized infantry should remain with these tanks to furnish local security.

(3) Tanks employ high explosive ammunition against street barricades. Steeples, tall chimneys, and other structures likely to contain enemy artillery observers are destroyed promptly. Crewmembers must be alert to detect pillboxes built into houses along the street. Tanks should not halt or move slowly close beside buildings not held by friendly troops, because enemy troops might drop explosives or flammables upon them. All bridges and overpasses should be checked for mines and for weight-carrying capacity. Boobytraps of all varieties are to be expected. Tanks should not move singly, and specific riflemen should be charged with protection of specific tanks.

(4) Moving tanks keep fairly close to buildings on either side of the street held by friendly troops, covering the opposite side and firing at anything suspicious (fig. 34). All tank crewmembers are alert to detect signals from the infantry in the houses to each flank. Tank commanders keep

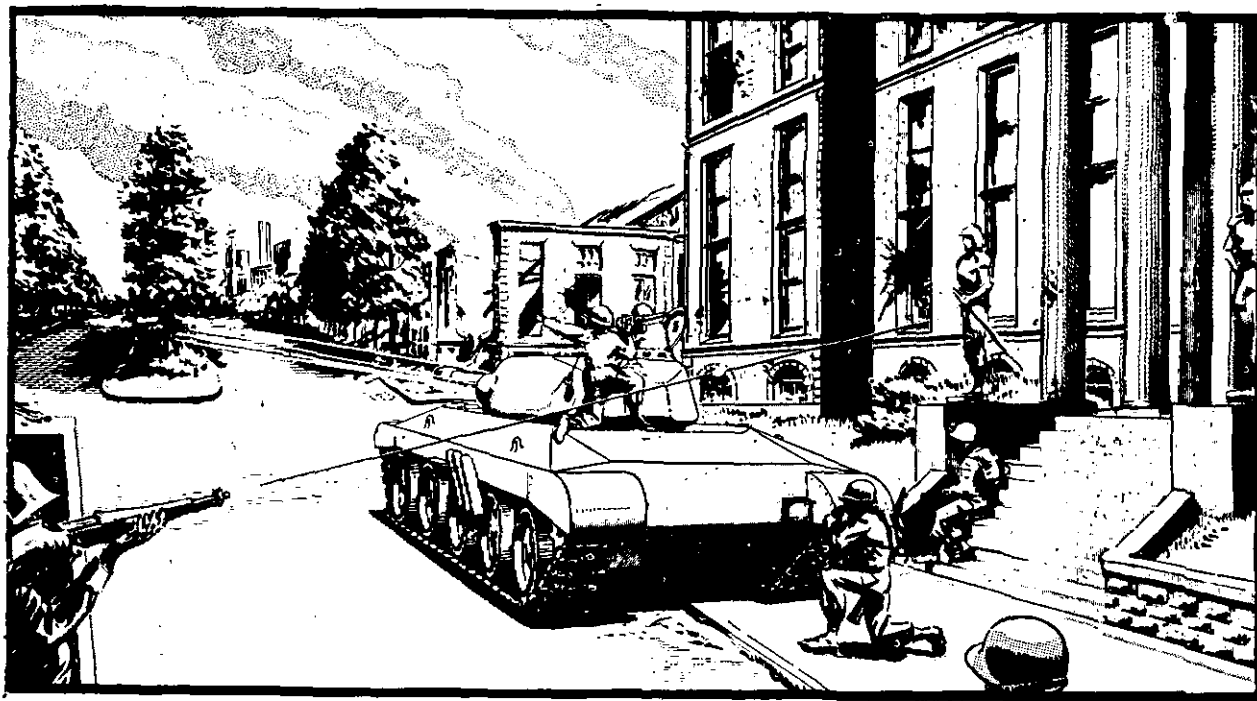


Figure 33. Tanks take under fire targets indicated by mechanized infantry (dismounted).

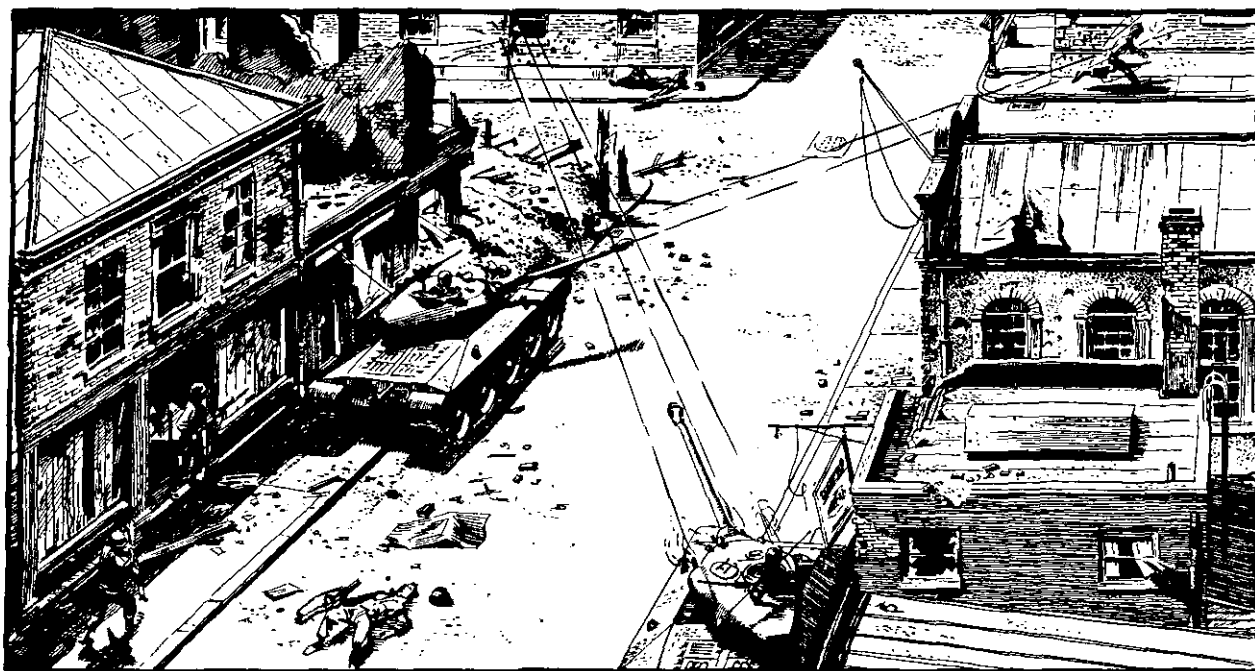


Figure 34. Movement of tanks.

their personal weapons and hand grenades ready for close-in defense.

b. Artillery. The artillery is employed under centralized control in its normal role of close support. During phase III, the effectiveness of artillery fires will be reduced because of restricted observation and proximity of friendly and enemy troops. The artillery employed during this phase should be capable of firing high-angle fire so that it will clear the taller buildings. Time fire and proximity-fuze fire are effective against enemy on rooftops and behind barricades. The 105-mm and 155-mm self-propelled howitzers are effective as direct-fire weapons in support of the attacking troops, but are vulnerable to enemy antitank fire.

c. Mortars. 4.2-inch mortars and 81-mm mortars are usually employed in general support of their parent unit. Mortars firing high explosive shells with point detonating fuzes are useful against rooftop targets. Use of delay fuze settings will permit projectiles to penetrate roofs and destroy the enemy inside buildings. These weapons may be used to provide smoke screens to cover the advance of assault elements across streets, parks, yards, and other open areas as well as being used in their normal role.

d. Engineers. Attached or supporting engineers should be well forward and will frequently operate under the control of the attacking battalion task force. When used as part of an assault team, they are attached to the team. The normal mission of the engineers is to remove mines, clear barricades and debris, and execute demolitions.

e. Nuclear Weapons. Nuclear weapons are not likely to be used in conjunction with a ground attack on a built-up area, except possibly on a large city. The progress of the ground attack would be seriously hampered by the effects of a nuclear explosion.

364. Communication

Radio communication during phase III may be affected adversely by steel girders and other obstructions in the built-up area. Wire communication will assume greater importance than in other types of offensive operations. Foot messengers will frequently be the most reliable means of communication. Visual and pyrotechnic signals may be used by smaller units to indicate the need for fire, the shifting and lifting of fires, and to announce the seizure of a building or group of buildings. Armored

personnel carriers may be used to provide mobile, protected communication centers.

365. Logistics

a. Evacuation of Wounded. Evacuation of wounded from rooftops and upper stories of buildings may require additional litter bearers and the use of special evacuation equipment. Plans should include marking buildings that contain wounded personnel.

b. Supply of Ammunition. Large quantities of ammunition are consumed in this type of operation. Therefore, ammunition supply points should be well forward, and mobile supply points may be required down to team level. Consideration should be given to the use of armored personnel carriers to resupply the assault echelons.

Section XI. AMPHIBIOUS OPERATIONS

366. General

a. Amphibious doctrine is set forth in FM 31-11, FM 31-12, FM 31-13, and pertinent Department of the Navy publications. For explanation of Navy and special terms used in amphibious warfare, see AR 320-5. Detailed guidance on embarkation and ship loading is contained in FM 60-30.

b. An amphibious operation consists of isolation and preparation of the objective area for the landing and activities of the forces involved in the oversea movement, assault, support, and consolidation. It is a joint operation when the assigned forces are composed of elements of more than one service.

367. Armor Units in Amphibious Operations

a. The tank battalion of the infantry division participates in the assault in support of the division mission. The armored or mechanized division, because of its heavy vehicles and equipment, is not normally used in the assault phase of an amphibious assault. However, in certain situations the early landing of armor units (brigade/regiment or smaller) may be desirable to effect early linkup with airborne or airmobile forces or to seize key terrain dominating the landing area. Once ashore, the tactical employment of armor units is as in land warfare.

b. In large-scale amphibious operations, a beachhead may be secured by infantry; then an armored division or a brigade may be landed to add its firepower, mobility, and shock effect in further operations.

c. A mechanized infantry battalion, less carriers, may be used in the assault landing.

Its employment is similar to that of a battalion landing team of an infantry division. Its carriers should be brought ashore as soon as possible so that it can resume operations as mechanized infantry.

d. Armored and air cavalry may be employed on reconnaissance and security missions before, during, or after the assault landing. Armored cavalry may be employed between major elements of a widely separated landing force to maintain contact between the elements, or to seize lightly defended objectives.

368. Planning

a. Planning for the employment of armor units in amphibious operations is conducted concurrently and coordinately with other elements of the amphibious task force. Planning begins on receipt of the initiating directive and continues for the duration of the operation. Basic factors influencing planning for tank employment are—

- (1) Mission and concept of operations of the landing force.
- (2) Enemy disposition and capabilities, with particular attention to antitank defenses and enemy armor.
- (3) Terrain, weather, and hydrography of the landing area.
- (4) Troops, tanks, and ships and landing craft available.

b. These factors must be considered throughout the planning cycle. Following the commander's concept and the issuance of his planning guidance, a decision is made as to armor employment. The armor unit commander then becomes a special staff officer of the unit to which he is assigned.

c. The directive from higher echelon for an amphibious operation, intelligence, and information of available shipping are the basic tools with which to start planning for the employment of armor units. The continuous receipt of intelligence and timely requests for additional intelligence pertinent to tank employment are essential to planning.

369. Preparation of Tentative Plan

a. The armor adviser participates in the preparation of the tentative plans at division and higher landing force headquarters. Information is exchanged between this officer and other staff officers. Specifically, the armor adviser considers the detailed employment of armor units and makes recommendations on the following:

- (1) Total number and type of armor units to be employed.
- (2) Task organization.
- (3) Missions and objectives.
- (4) Command relationships, by phases if appropriate.
- (5) Place and manner of landing.
- (6) Time of landings.
- (7) Coordination with naval gunfire, air, artillery, infantry, and engineers.
- (8) Antitank protection.
- (9) Special measures to be taken for communication, supply, and maintenance.
- (10) Requirements for special vehicles, such as flamethrower and flail tanks.
- (11) Requirements for assault shipping and landing craft to support the tentative plan.

b. Upon completion of the tentative plan by higher headquarters, staffs of the armor units enter into the planning. Based on the plans of the higher headquarters, these units begin preparation of their own operation and administrative plans. At the same time, the armor advisor assists supported units in preparing the supported unit's plans.

370. Organization for Combat

a. Tank battalions may be employed under division control or attached to brigade. In either event, they may be employed as a unit, may attach one or more tank companies to

infantry battalions, or be employed as the nucleus of a tank-heavy task force.

b. The conflicting requirements of concentration of means and separation of tactical units, on the one hand, and centralization or distribution of support elements on the other, must be resolved by the landing force commander in his plans for organization for combat, and reviewed continuously during the operation.

c. Attachments may be in effect before embarkation or upon landing, depending on the landing plan.

371. Landing Plans

a. The landing plan must support the scheme of maneuver of the landing force ashore. Basic considerations of the amphibious assault with regard to use of armor units are the following:

- (1) Armor units are required ashore early to assist the infantry in rapidly seizing initial objectives or to perform reconnaissance and security missions.
- (2) They are a valuable weapon in protecting the landing forces from early attack by enemy mechanized forces.
- (3) If landed early, they tend to reduce casualties among the infantry and are a morale factor in early stages of the amphibious assault.
- (4) Armor units should be landed early when the mission demands tanks as a part of a mechanized task force.
- (5) They must be landed without excessive vehicular losses.

b. Methods of timing the landing or armor units or vehicles are—

- (1) They may be landed in a scheduled wave. This method is suitable when it is practicable or desirable to land tanks or armored cavalry early.
- (2) The on-call method is used when conditions ashore are unsatisfactory for the landing of vehicles and the beach must be prepared for landing.

c. The method selected should best suit the situation and be the most efficient ship-to-shore movement. Armor units may be organized by either of two methods for the landing—

- (1) Units may be attached to a brigade or battalion landing team for the landing and assault of the beach.
- (2) Units may remain under command of the armor unit commander until they have landed. Attachments to accomplish task organization may become effective upon landing or as stated in orders.

372. Embarkation Plans

a. The need for large-capacity landing craft and ships and the time required in loading and unloading tanks demand detailed planning for the embarkation and subsequent landing. The type and number of tank-landing craft and landing ships required is determined by the anticipated tactical employment of the unit. The selection of tank shipping and landing craft, therefore, is governed by several factors, including the scheme of maneuver, characteristics of the beaches, and presence or absence of offshore obstacles. When possible, tactical considerations govern the planned use of shipping. However, the shipping available will seldom support the desired tactical plan without adjustment to the tactical plan.

b. When shipping assignments have been made, tentative ship loading plans (forms) are prepared by unit embarkation officers and are submitted to the commanding officer of the ship for approval. When approved, they constitute the final loading plans and govern the loading of the ship. Changes are made only with approval of the commanding officer of the ship and the commanding officer of troops concerned. Disagreements are referred to next higher level of command for resolution.

c. Detailed information of embarkation planning is contained in FM 60-30.

373. Administrative and Logistics Plans

a. The logistics plan for armor units in an amphibious operation is based on the unit's tactical plan and the logistics plans of higher echelons. There is no steadfast rule by which planners can decide the supplies units will carry and the supplies that higher echelons will provide. Decisions as to the equipment and supplies each echelon will carry are issued in

directives from higher headquarters. The directives are based on the overall plans for the operation and previous usage factors. Examples of planning considerations that must be studied carefully to determine the means of logistic support for armor units are—

- (1) Duration of the operation.
- (2) Shipping available.
- (3) Type of operation.
- (4) Estimated date of arrival of supply shipping.
- (5) Method and means of unloading.
- (6) Size of the objective.

b. During the planning phase, decisions are made that permit the S4 to procure supplies and equipment required for the training period, embarkation phase, and initial phases of the actual operation.

c. Fuel, ammunition, rations, repair parts, and special supplies and equipment are obtained. This includes waterproofing equipment, cold weather equipment and clothing, special type munitions such as flamethrower fuel, and tank accessories or attachments. Units carry repair parts based on replenishment rates. It is important that minimum supplies to fill basic requirements be carried. An important consideration is replacement of vehicle losses. It is not desirable for a combat unit to carry its own replacement vehicles. Replacement of combat losses is normally the responsibility of the command element conducting the overall operation.

d. Regardless of the landing plan, plans must provide for placement of supplies where they will be available when required. Floating dumps and beach dumps are methods of providing supplies. Liaison with appropriate logistic agencies afloat and ashore should be effected early to insure availability of supplies ashore.

374. Shipping

The type of shipping to which armor units are assigned affects their availability for landing to support the tactical plan. Shipping suitable for landing tanks consists of two general categories, landing ships and landing craft. Each type of landing ship has several classes of construction, and ships differ in their capa-

bilities, cargo, and troop capacity. Final embarkation loading plans can be developed only after a study of the characteristics of the ships being used. The characteristics are provided in ships' characteristics pamphlets and amplified through direct liaison with ship's officers.

375. Preparation for Embarkation

a. Loading and embarkation plans for units are prepared before the arrival of assault shipping at the embarkation point. Armor unit embarkation officers prepare these plans in conjunction with embarkation officers and Navy commanders concerned. Vehicle crews and maintenance men should always be embarked with their vehicles.

b. The commanding officer of troops and the ship's representative arrange other details of embarkation, which may include—

- (1) Assignment of personnel to billets and working parties.
- (2) Stowage of fuel, lubricants, and maintenance material so that appropriate items are available for servicing vehicles and weapons while embarked.
- (3) Organization of security details and messing procedures aboard ship.
- (4) Use of ship's equipment and personnel to assist in servicing equipment en route.
- (5) Provisions for en route training as may be feasible.

c. The unit commander and his subordinates supervise and control preparation, marking, and protection of the unit supplies and equipment. Before arrival of assault shipping in the embarkation area, all supplies and equipment are prepared for loading. A final inspection is made to insure that tanks and other vehicles and equipment are ready for combat. Tanks are always prepared for deepwater fording before embarkation.

376. Embarkation

In the embarkation of armor units it is important to retain, so far as possible, the integrity of the unit as organized for combat. The LSD's and LST's—because of their greater capacity—generally facilitate the maintenance of unit integrity. To expedite the loading oper-

ation personnel must be familiar with different methods of ship loading.

377. Movement to the Objective Area

a. Security regulations usually preclude detailed briefing of all personnel before embarkation. Therefore, they are informed of details of the operation during movement to the objective area. All personnel must understand their duties and be thoroughly familiar with the overall plan. Each commander or leader should know the relationship of his mission to the plan of the units in the amphibious troops. Briefings for personnel should emphasize the following:

- (1) Mission.
- (2) Scheme of maneuver.
- (3) Details of the beach assault.
- (4) Procedure for the ship-to-shore movement.
- (5) Location and methods of communication with command posts, liaison personnel, and the naval control organization.
- (6) Condition of the beaches, nature of obstacles, beach exits, terrain inland, and terrain trafficability.
- (7) Plans for breaching beach obstacles.
- (8) Tentative location of initial assembly areas and instructions for water-proofing.
- (9) Plans for location of maintenance and supply facilities ashore.
- (10) Enemy situation, with particular attention to antitank defense.

b. Intelligence information received during movement to the objective area should be disseminated to all personnel. This information is obtained from air observers, submarine periscope photographs, and reports of underwater demolition teams and reconnaissance units. Provision must be made for disseminating pertinent information to each separately embarked unit.

c. The commanding officer of the troops and embarkation team commander are responsible for shipboard routine and training.

d. Vehicles should be loaded so that they are accessible for servicing during the voyage.

Daily servicing and final preparation for combat must be planned, scheduled, and performed, including—

- (1) Prestarting checks.
- (2) Daily running of engines for approximately 10 minutes.
- (3) Checking batteries.
- (4) Checking controls and linkage to insure free movement.
- (5) Final application of waterproof sealing compound on D-day minus one.
- (6) Constant preventive maintenance on communication equipment.
- (7) Constant preventive maintenance on armament.

e. Vehicles must be well secured aboard ship. Tank landing ships are equipped with securing chains. During extremely heavy seas chains alone may not prevent heavy vehicles from slipping on the ship's steel decks. Therefore, heavy shoring timber is placed on deck between the vehicles and flush with the tracks. Shoring is used in conjunction with securing chains. Dunnage must be placed under vehicles having steel tracks. In heavy seas, a continuous watch is maintained to insure that securing chains and shoring remain in place.

f. All removable vehicular weapons are test fired during the voyage. Fire control equipment should also be tested.

g. The following precautions are observed during the voyage:

- (1) Engines are not run or fueled without permission of the ship's commanding officer.
- (2) Vehicles in LST's are neither started nor fueled below decks unless enough blowers are operating.
- (3) Vehicles are fueled one at a time.
- (4) Fire extinguishers are kept on hand and fire precautions observed when fueling.
- (5) Tank shift levers are in park position while the ship is underway.
- (6) Personnel move cautiously between vehicles when the ship is underway, particularly in rough seas.
- (7) Tarpaulins used to cover tanks are checked continuously to insure that the vehicles are protected from salt spray.

- (8) Radio transmitters are not tested until radio silence is lifted.

h. Final preparations for unloading and operations ashore are started enough before the time of landing to allow personnel to—

- (1) Top off oil and fuel tanks.
- (2) Secure oil and water cans to be carried on vehicles.
- (3) Check and place vehicular maintenance equipment in vehicles.
- (4) Check turret fire control mechanisms.
- (5) Install final waterproof sealing.
- (6) Mount, check, and boresight weapons.
- (7) Check oil reservoir, power traverse, and elevation systems.
- (8) Test radio equipment—after radio silence is lifted.

378. Ship-to-Shore Movement

a. The ship-to-shore movement of armor units is influenced by the landing craft and landing ships to be used. In turn, the ship and craft requirements are based on the mission, scheme of maneuver, beach characteristics, and offshore obstacles. These factors determine in part the method of landing. One other important consideration is whether or not the beach is defended.

b. Against defended beaches it is necessary to conduct a waterborne deployment of combat units. However, the threat of nuclear attack precludes massing large quantities of shipping, troops, and equipment. Therefore, assault troops are landed from dispersed shipping in controlled waves of small craft and amphibian vehicles over widely separated beaches with long intervals between waves. To reduce casualties during such landings, vehicles are landed from less vulnerable small craft, such as LCU's and LCM's. Effort should be made to land tanks early so that they may facilitate the infantry's passage of the beach and seizure of initial objectives.

- (1) When shipping availability permits, units to be landed on defended beaches should be preloaded in LCU's or LCM's and launched from LSD's in the unloading area. Once debarked, the landing craft will assemble and proceed as a group to the line of departure. Here they will either deploy

and cross in scheduled waves, or layoff in a designated area awaiting the order to land in on-call waves. Landing craft must be disembarked to reach the line of departure or landing beach at the time designated in the assault schedule. Upon crossing the line of departure, they continue directly to the beach.

- (2) Because of the shallow draft of the LCU and LCM, vehicles should make a relatively dry landing. However, if they must emerge from the ramp into uncertain waters, they should have guides—individuals, markers, buoys, or LVT's—to insure that they reach shore without striking mines or other obstacles or being drowned out in underwater potholes. Once ashore, armor units join the infantry units to which attached, and assault and execute the beach passage, seizing at least enough ground to protect the beach from aimed small arms fire. Armored cavalry units proceed to execute assigned missions.

c. When assured that the landing beaches are lightly defended, and that terrain and hydrography conditions permit, tanks and armored personnel carriers or landing vehicles, tracked, personnel (LVTP) are embarked on LST's for debarkation directly onto the beach. The armor assault landing team should be loaded aboard the LST with the vehicles positioned to land tanks first. When the LST's beach, tanks debark and proceed immediately to points of egress from the beach.

d. Task organization and loading may provide for contingency landing plans. When preparing for landing on a beach where the probability of defense is low, tanks should be embarked to permit an assault landing against the defended beach, while still possessing a subsequent exploitation potential. This may be accomplished when the armor unit is sufficiently large, by placing some of the tank units aboard LSD's preloaded with LCU's or LCM's, while the remainder of the armor unit is aboard LST's. The enemy situation in the landing area will decide the mission and units that will land

first. If the beach is undefended they may all land at the same time.

379. Time and Place of Landing

a. In an amphibious operation tanks are needed as soon as the initial wave of assault troops land; therefore, they should be landed at the earliest possible time. Against a beach undefended by antitank weapons and obstacles, tanks may be landed in advance of, or with, the infantry; however, a beach strongly defended by antitank weapons and obstacles prevents the early landing of tanks.

b. The scheme of maneuver is designed to accomplish the mission in the most expedient manner. Therefore, a place and time of landing for armor units should be selected that will support most satisfactorily the scheme of maneuver.

c. The type and number of ships and crafts available to transport tanks may determine where the unit must land, and will determine the rate of buildup of tank strength ashore.

d. The beach gradient, offshore reefs or sandbars, navigability of the approach lanes, and the waters surrounding the objective area influence the choice of the landing site. A beach should be selected where the soil is trafficable and the gradient not too steep. It should have routes of egress ample to sustain the momentum of the attack, and so located that they support the scheme of maneuver. The landing of tanks will be delayed where offshore reefs bar passage of tank-laden craft, the gradient is poor for beaching, soil trafficability is poor, or where it is necessary to emplace causeways.

e. Beach minefields and obstacles must be breached or overcome before the main tank landings if losses are to be minimized and the momentum of the attack sustained. Obstacles offshore, on the beach, or inland from the place of landing, whether natural or manmade, should be avoided. If avoidance is impossible, a site should be selected where they can be breached most easily.

f. Tanks in tank landing craft present a profitable target for well-placed antiboat weapons. These weapons may influence the place of landing or cause delay, as they must be avoided or neutralized.

g. In the selecting of a landing site for tanks, trafficability inland from the beach must be con-

sidered. The terrain inland should provide ample maneuver area, a suitable road net, and cover and concealment.

h. The enemy disposition, particularly the strength, location, and capabilities of his armored formations, and antitank defenses are important in the selection of a place and time to land. Enemy antitank defenses should be avoided.

380. Obstacle Clearance and Breaching

a. Beach and underwater mines and obstacles must be cleared rapidly to permit landing and effective employment of tanks. Clearance of underwater obstacles seaward of the highwater mark is accomplished by Navy underwater demolition teams, usually during the preassault phase. Mines and obstacles inland from the highwater mark are cleared by the landing force. Time seldom permits removal of all mines and obstacles. Only certain routes across the beaches will be cleared for passage early in the landing. It is often necessary to alter the prescribed landing formation and submit to a degree of canalization during the beach passage. To reduce lateral movement necessary to reach the cleared lanes after the units have reached the beach, information received from armor unit officers on the beach must be relayed immediately to commanders of LST's and appropriate control vessels, so that the units can be beached as close as practicable to the lanes cleared by the shore party. The lanes selected should be located so as to insure—

- (1) Sufficient breadth to accommodate the width of the tank.
- (2) Sufficient number to permit rapid egress from the beaches.
- (3) Access to a road net or area that is trafficable.
- (4) They correspond to the planned landing points of the units.
- (5) Minimum of lateral movement after units have landed.
- (6) Landing points leading to cleared lanes are identifiable from seaward.

b. Because these lanes are of primary importance to armor units, armor personnel and equipment should assist in their clearing. Armor reconnaissance personnel are integrated with engineers into teams. They assist in

demolition and removal, selection and marking of the lanes, and the guidance of vehicles through the lanes. Other support are the tank-mounted dozer for obstacle removal, and the gun tank for obstacle destruction and team protection. When landed with the breaching teams, the tanks can serve as logistics vehicles, carrying bulky items ashore. Organization of mine and obstacle breaching teams is based on an analysis of the specific tasks to be encountered.

c. Breaching teams should be organized to land with the leading scheduled waves, often with the first wave of assault troops. Each team clears at least 1 vehicle lane 18 to 24 feet wide. The scope of breaching teams' mission must be delineated distinctly during planning and provide for the reversion of its components to parent control as early as possible. Armor unit commanders must insure that the dissolution of the teams includes disposition of the breaching equipment.

381. Guiding Vehicles Ashore

a. Landing conditions may require units to cross reefs, tidal flats, or other areas covered by shallow water. Vehicles must be guided around obstacles that might cause them to hang up or engines to drown out. An amphibian tractor may be employed to guide vehicles ashore after debarkation. If this method is used, guide vehicles must be designated well in advance of the landing to allow for briefing and communication planning.

b. A crewman may dismount and guide by wading ahead of the vehicle. This method is slow, especially if the water is deep or the bottom is rough. Guides are vulnerable to hostile fire. This method is satisfactory for short distances only.

c. Reconnaissance personnel may mark lanes to the beach. However, marking devices such as buoys are moved or destroyed easily by enemy action or by natural causes.

382. Passage of the Beach

a. To avoid congestion and tank losses at the waterline and on the beach, passage of a defended beach area is planned and coordinated carefully and executed aggressively. Liaison, reconnaissance, and breaching teams must per-

form their tasks quickly and thoroughly if armor units are to provide timely and effective support of the beach assault. Landing sites that support the scheme of maneuver are selected and lanes through them cleared and recognizably marked. The location of lanes, targets, missions assigned by supported infantry, and other pertinent information are transmitted promptly to the attached tank unit commander during the ship-to-shore movement. As the tanks emerge from their landing craft, they are met by guides and directed through the cleared lanes to the points from which they support the attack. Tank units may support the beach assault in the following manner:

- (1) Gun tanks lay down a blanket of small arms fire with machineguns while engaging hard targets with their main guns.
- (2) Dozer tanks or the combat engineer vehicle cover apertures and entrances to emplacements, assist in preparing antitank ditch crossings, and aid in mine breaching operations inland. They assist in the immediate improvement of the newly seized beaches if the tactical situation ashore permits.
- (3) Flame tanks reduce enemy positions not susceptible to other weapons available ashore during the early period of the landing and assault.

b. Against undefended beaches, mass landings can be made by integrated assault teams transported in vehicles. Teams will debark from the landing ships directly onto the beach and attack inland.

c. During the ship-to-shore movement, armor unit commanders receive information by radio from their reconnaissance and liaison personnel ashore. The information includes the condition of the beaches, progress of beach clearance efforts, recommendation of the best beaches for vehicles to land on, and other pertinent information. After landing, vehicles are met at the edge of the water and are informed of the best routes across the beach. They are then led through the cleared lanes by guides. The cleared lanes are marked to be clearly visible from within the tank, usually by strips of tape placed along the edge of each lane.

d. If intelligence is complete and indications are that mines will not be encountered on the beach, and hydrographic conditions are favorable, tank units may be landed as the first wave. They should land from 2 to 5 minutes ahead of the initial wave of infantry. The landing and the initial wave of troop-carrying craft or vehicles must be timed precisely to obtain maximum effect from shock and firepower, and to provide close infantry protection early in the assault. If heavy enemy resistance at the waterline is expected, the tank units landing in the initial wave will land usually in a line formation to bring the maximum firepower to bear on the hostile defenses.

383. Training

Amphibious training for Army units is outlined in chapter 13. FM 31-12. This training is normally supported by Naval amphibious training commands, and may be conducted at the unit's base station by landing force training units.

Section XII. SHORE-TO-SHORE MOVEMENTS

384. General

This section provides general guidance for armor commanders and staff officers in the execution of shore-to-shore movements by armor units. Chapter 16, FM 31-12, provides general guidance for commanders, staff officers, and other interested personnel for the planning and execution of shore-to-shore operations and movements. AR 320-5 defines shore-to-shore operations and shore-to-shore movements.

a. Shore-to-shore movements include some

of the techniques of amphibious operations and river-crossing operations, and involve procedures and considerations related to each of them. Shore-to-shore movements, although similar to, are not amphibious operations because they do not involve embarkation in Naval ships; however, both operations involve assault landings on a hostile shore. The shore-to-shore movement is conducted normally by Army forces alone, employing primarily Army transportation of the waterborne movement of the force.

b. As is the case with amphibious operations, armor units may be employed in several types of shore-to-shore movements:

- (1) Attack.
- (2) Withdrawal.
- (3) Raid.
- (4) Deceptive operation (demonstration or feint).
- (5) Reconnaissance.

c. Shore-to-shore movements may be conducted across lakes, along coast lines, across bays, or against offshore islands.

385. Considerations

a. The participation of armor units with their vehicles in shore-to-shore movements will be dependent on the types and load-carrying characteristics of the assault craft available for the operation.

b. The extent of participation by armor units in the assault is limited by the number of landing craft available, in that the assault elements must be contained in a single lift.

c. The relatively heavy requirements for logistical support of armor units must be considered in light of landing craft available for this support on the far shore. Air vehicles may be required to augment surface craft.

386. Planning Guidance

a. The general considerations in planning for employment of armor units in a shore-to-shore movement are the same as those in planning an amphibious operation, and the near shore actions in a deliberate river crossing.

b. The control of the waterborne movement in a shore-to-shore movement is an Army function; in amphibious operations, it is a Navy function. This responsibility will probably rest with the Engineer Amphibious Support Command as augmented by transportation corps units under the direction of the overall tactical commander responsible for the operation.

c. Critical factors such as terrain, weather, and hydrography of the far shore must be emphasized when planning the employment of armor units in the assault landing.

d. The armor commander must include all aspects of the deliberate river-crossing operation in determining his concept of armor em-

ployment. He must plan for the assembly of armor units and their means of waterborne transportation on the near shore. The arrival of armor units in the embarkation area on the near shore must be phased so that those units participating in the assault of the far shore arrive first and are loaded first. Unnecessary massing of units in the embarkation area must be avoided.

e. Armored cavalry units, less their tracked vehicles, and mechanized infantry units, less their personnel carriers, may participate in shore-to-shore movements when landing craft are not available for their vehicles. In this event, the shore-to-shore movement will be conducted as infantry in an amphibious operation or deliberate river crossing with vehicles either shuttled across after the assault or moved around the shore for a linkup.

387. Preliminary Planning

a. An armor commander initiates planning for a shore-to-shore movement in response to directive from higher echelon or as an operational requirement in his own command.

b. The availability of landing craft capable of lifting vehicles will determine armor's participation; therefore, the first step in planning is to determine the numbers of landing craft that will be available.

c. During preliminary planning the armor commander must determine—

- (1) The overall concept of the operation.
- (2) Any Navy or Air Force support in the form of ships, landing craft, or aircraft that may be available.
- (3) The objective area.
- (4) The amphibious area and specific embarkation points suitable for armor units on the near shore.
- (5) The terrain and hydrography of the objective area.
- (6) The task organization for support of the assault landing and subsequent operations in the objective area.

d. Dependent on the determinations made (b and c above), the armor commander recommends—

- (1) Embarkation points on the near shore and landing points on the far shore for armor units.

- (2) Task organization of armor units in support of operations on the far shore.

388. Conduct of the Assault

The assault on the far shore is conducted in the same manner as in an amphibious operation with subsequent operation ashore being as in normal land warfare.

389. Training

- a. Preliminary training for shore-to-shore assaults can be conducted as an adjunct to am-

phibious and deliberate river-crossing training. Advance training must be conducted in a waterborne training area and include training with the type landing craft that can normally be expected to be used for a shore-to-shore movement.

- b. The attainment of a high state of training in shore-to-shore movements will reduce the supplementary shore-based and ship-based training required for participation in an amphibious attack and will enhance the unit's capability for executing a deliberate river crossing.

Section XIII. OPERATIONS AGAINST IRREGULAR (INSURGENT) FORCES

390. General

Irregular forces refer in a broad sense to all types of insurgents, including partisans, subversionists, terrorists, revolutionists, and *guerrillas*. Insurgency is a condition of subversive political activity, civil rebellion, revolt, or insurrection against a duly constituted government or occupying power wherein *irregular forces* are formed and engaged in actions, which may include guerrilla warfare, that are designed to weaken or overthrow that government or occupying power. Operations against irregular forces involve two concepts—

- a. *Operations Against Irregular Forces*. These operations are undertaken by any unit as a normal part of combat operations in hostile territory. Such operations are secondary in nature to the conduct of a campaign against conventional forces, are considered a part of overall security operations, including rear area security.

- b. *Operations Aimed at Elimination of Major Resistance Forces*. The primary mission is the elimination of the irregular force, including the underground element and the indigenous support.

391. Conduct of Operations

a. General.

- (1) Operations against irregular forces may have to be conducted in any geographical area in the world. Therefore, cognizance must be given to the varying conditions in terrain, tailoring of forces, and special techniques em-

ployed in combating irregular forces. The particular environment in which operations are being conducted will dictate the most effective armor force to employ against the irregular force. Generally, these operations make maximum use of small, highly mobile, combined-arms task forces that can find, fix, fight, and destroy elusive irregular forces.

- (2) Airmobile forces may be used to advantage to gain access to the inner perimeters occupied by these hostiles, to permit encircling movements that might not be possible by ground forces, to cut off routes of escape, and to relieve friendly forces besieged by irregular elements.
- (3) Psychologically, the introduction of tanks is demoralizing to irregular forces. In addition, armored vehicles provide protected communication, mobile roadblocks, protected supply and evacuation, and escort convoy.
- (4) Armored cavalry units are effective against irregular forces, because of their extensive means of communication, mobility, and ability to perform reconnaissance and security missions. The air cavalry troop greatly enhances the capabilities of the divisional armored cavalry squadron to conduct operations against irregular forces in difficult terrain.
- (5) Aviation units are a principal means for collection of information concern-

ing irregular forces operations. In particular, the aerial surveillance platoon can rapidly identify suspect areas, which can then be reconnoitered, if required, by ground elements. Air vehicles can be used for movement of troops and supplies.

- (6) Operations with TOE armor units and tailored armor units are discussed in *b* and *c* below.

b. Operations with TOE Units. Operations against irregular forces are conducted normally in a sequence that is best accomplished concurrently, whenever possible. The sequence is: establishing combat bases in areas of irregular force activity; establishing control over civil populace; and destroying the irregular force by offensive action.

- (1) *Establishment of combat bases and static security posts.*

- (a) The commander will normally be assigned an area of responsibility when he is given the mission of combating irregular forces. In such a case, the unit organizes strong combat bases, normally at least of company team size, in its assigned area. Forces are grouped in sufficient strength to prevent defeat in detail by irregular forces.
- (b) Security, including use of warning and surveillance devices, is established for installations, equipment, and personnel. Irregular forces may have limited supplies. Emphasis is placed on safeguarding military materiel.
- (c) The commander will normally subdivide his assigned area into areas of responsibility for company teams. In these areas, company teams will normally establish combat bases as outlined in (a) and (b) above from which they carry out actions to eliminate irregular force activity. The commander may direct the establishment of static security posts to secure critical points (e.g., routes of communication). These static security posts may vary in size from several individuals to company-size units.

- (2) *Establishing control over civil populace.*

- (a) Every effort is made to isolate the irregular force from its source of supply, reinforcement, and recruiting by taking steps to reduce existing sympathy and deny support for the guerrilla forces. Methods of control include the use of restricted zones, curfews, passes, village relocation, weapons and food control, search of persons and buildings, self defense units, clandestine intelligence nets, riot control, censorship, and by establishing close liaison and coordination with civil authorities.
- (b) When friendly forces are successful in their encounter with local guerrilla bands, a feeling of insecurity is developed among enemy forces while the local population gains a greater confidence in friendly forces. Successful attacks conducted against located irregular forces will encourage the populace to resist guerrilla operations.

- (3) *Offensive action against guerrilla forces.* When irregular forces are located or reported, offensive actions are carried out against them. Those irregular forces willing to fight in open battle are isolated to prevent escape and are immediately attacked; those which avoid open battle are forced by a series of police and military actions into areas that permit encirclement. Once surrounded, such forces are destroyed by continuous determined attack.

- (4) *Types of offensive action.* The major offensive actions against irregular forces may be classified broadly as the encirclement, attack, and pursuit. The brigade and battalion normally participate in these actions as part of a larger force; however, they are also capable of conducting an independent encirclement, attack, or pursuit on a limited scale.

- (a) *Encirclement.* Encirclement of irregular forces is the most effective

way to fix them in position. The encirclement is made in depth with adequate reserves and supporting elements to meet possible guerrilla attack in force and block all avenues of escape. Support and reserve troops are committed as required to insure sufficient density and depth of troops and to establish and maintain contact between units.

1. The planning, preparation, and execution of the operation is aimed at *sudden, complete encirclement* that will totally surprise the hostiles. The move into position is accomplished normally at night to permit maximum security and surprise. The encirclement should be completed by daylight to permit good visibility for the remainder of the operation.
2. Upon arriving on the line of encirclement, units occupy defensive positions. The most critical period in the operation is the occupation of the line of encirclement, especially if the operation is at night. Large irregular forces formations may be expected to react violently upon discovering they have been encircled. The irregular forces will probe for gaps, and weak points to force a gap. Escape routes may be established deliberately as ambushes.
3. Units organizing the encirclement deploy patrols to their front. Air reconnaissance is used to supplement ground reconnaissance. Reserves are committed if irregular forces succeed in breaking through or infiltrating the line of encirclement.
4. Once the encirclement is established, the elimination of the guerrilla force is conducted methodically and thoroughly. A careful contraction of the encirclement is begun. This may be accomplished by—
 - (a) A simultaneous controlled contraction of the entire encirclement.

- (b) Driving a wedge through the irregular force to divide the area, followed by destruction of the irregular forces in each subarea, individually.

- (c) Establishing a holding force on one or more segments of the perimeter and tightening the others against them.

5. During any of these methods, the units that advance through the hostile area must be impressed with the necessity of searching every possible hiding place thoroughly for irregular troops and equipment. Successive echelons comb the terrain again. Areas that appear totally inaccessible, such as swamps or marshes, must be searched thoroughly. Ruses discovered must be reported promptly and disseminated to all participating units. All local individuals, including men, women, and children, found in the area, are held in custody and are released only after identified as friendly.

- (b) *Attack.* When time, inadequate forces, or the terrain do not allow use of large scale encirclement, the brigade/battalion may conduct an attack on located irregular forces by using the normal offensive maneuvers. Emphasis is placed on secrecy to achieve surprise. Speed is essential to the conduct of the attack since the enemy has little or no interest in terrain and can be expected to vacate the area when he cannot be assured of victory.

- (c) *Pursuit.* The brigade/battalion may be required to pursue irregular forces after an attack or encirclement. Planning and conduct of the pursuit are similar to that discussed in chapter 9. Emphasis is placed on air and ground surveillance to insure that enemy forces do not escape or set up an ambush. Airmobile forces are frequently used in cutting off escape routes.

c. Operations with Tailored Forces.

(1) Composition.

- (a) Composition of tailored forces will vary with the geographic area in which they must operate. Generally, light ground elements, that is scout sections, rifle squads, and support squads of the armored cavalry troop and infantry elements of the mechanized rifle company will form the nuclei of tailored forces. Air vehicles may be used to move, supply, and reinforce these forces.
- (b) Mechanized infantry battalions may also be used to form fast, mobile, hard-hitting task forces. Air cavalry units and air vehicles may be a part of the task force to provide greater mobility.
- (c) Artillery, engineers, medical, psychological warfare, military intelligence, signal, and civil affairs units will also be included in a tailored force.

(2) Variations in techniques.

- (a) Operations conducted by tailored forces will not vary greatly from those employed by TOE units. Rather, it is a matter of emphasis. Great reliance is placed on combat patrols, roadblocks, raids, ambushes, and pursuit actions until such time as the irregular forces can be contained.

- (b) Initially, artillery control is decentralized to support the widespread operation.

- (c) The tailored force may also employ guerrilla methods: often moving at night; remaining concealed during the day; using hit and run tactics; surprise, mobility and dispersion of forces.

392. Administrative Support

a. When armor units are operating at a considerable distance from support elements, the strength of accompanying combat trains in the area may be increased considerably, including attachment of division support elements. Because of the frequency of independent and semi-independent operations, the provision of supplies and evacuation of casualties may pose serious problems. Protected convoys may be required for supply trains and medical evacuation. Emphasis will be placed on air supply and air medical evacuation. Conditions may dictate frequent use of motor vehicles or hand-carrying parties for some supply operations. When practicable, local civilian labor is used.

b. Within the restrictions of international law, maximum use is made of non-US forces and personnel for all activities in which they may be employed profitably. These include combat operations, security of the civil populace and critical facilities and installations, and use of guides and interpreters.

Section XIV. DIVISION REAR AREA SECURITY

393. General

a. The term *rear area security* refers to measures, except for active air defense, taken to neutralize or destroy localized enemy forces, of conventional or insurgency nature, which constitute threats to units, activities, and installations in the division rear area. Enemy operations and threats that endanger the command as a whole become operational matters and are beyond the scope of rear area security operations.

b. In forward areas, each combat unit is responsible for its own local security. Unit, activity, and installation commanders (tenants)

in division rear areas are responsible for their own local security. However, armor unit may be designated as rear area security forces to conduct operations in the division rear area that are beyond the capabilities of these tenant units, activities, and installations.

394. Rear Area Security Operations

a. *Concept.* Rear area security operations, by armor units designated as rear area security forces, include the location, engagement, and destruction of guerrilla, infiltrator, sabotage, and conventional forces whether ground, air-borne, or airlanded. Tenant unit, activity, or

installation commanders conduct defensive operations primarily and limited offensive operations within their capabilities. The primary function of the rear area security force is to fix and destroy the enemy or to keep the hostile elements sufficiently off balance to preclude their launching successful offensive operations. In the event hostile attacks occur, rear area security forces are deployed rapidly to defeat the enemy elements or to contain the attack until additional forces are committed.

b. Missions. An armor unit designated as a rear area security force is assigned the mission of protecting the entire division rear area or specific territorial areas in the division rear area, by the division commander. The protection of the designated territorial areas includes—

- (1) Relief of attacked installations and units.
- (2) Protection of lines of communication
- (3) Denial of drop or landing zones.
- (4) Surveillance of possible bases of operations for insurgency forces.
- (5) Finding, fixing, and destroying enemy conventional forces and enemy insurgency forces operating in rear areas (fig. 35).

c. Planning.

- (1) The commander responsible for security of an area reconnoiters his assigned area to determine key terrain to defend, the location of installations, and likely enemy drop zones, landing areas, or assembly areas. Based on intelligence and other information furnished by higher headquarters, the commander and subordinate commanders familiarize themselves with capabilities of insurgency forces and enemy airborne and airlanded assault capabilities. Based on his reconnaissance and study of the enemy capabilities, together with a consideration of troops available and the mission, the commander develops his plan.
- (2) Major components of the commander's plans included—
 - (a) Surveillance of the entire area of responsibility.
 - (b) Counterattack of airborne or airlanded forces.
 - (c) Operations against irregular forces (insurgents).

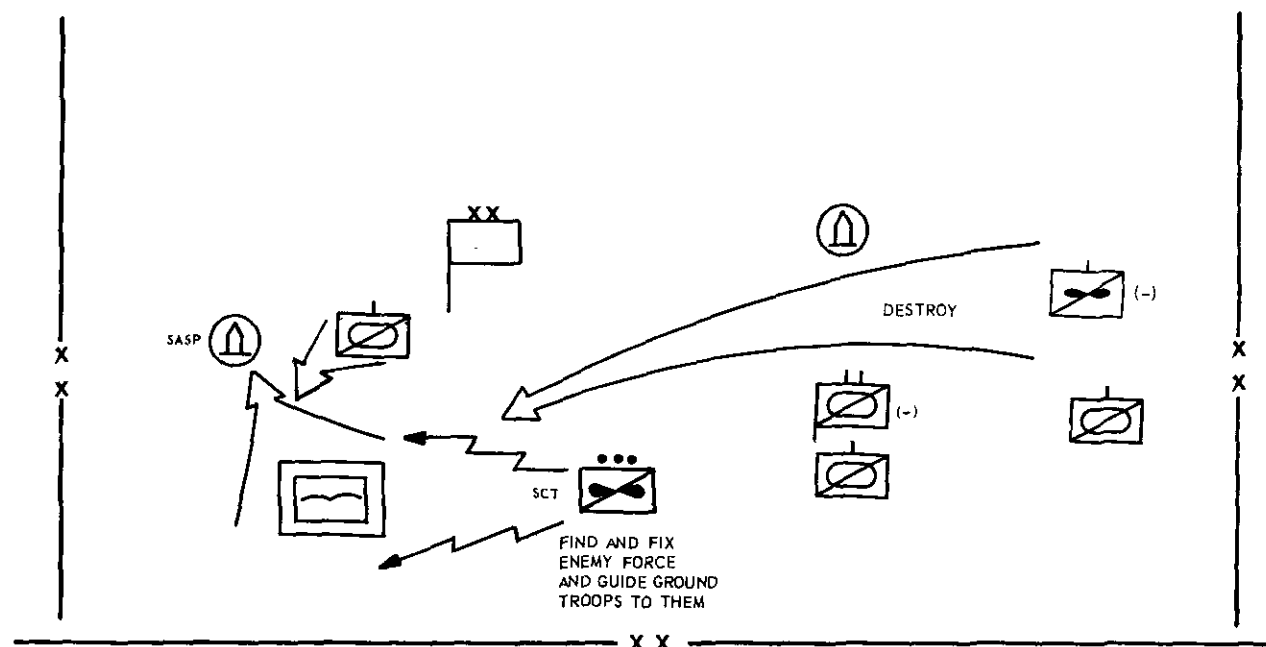


Figure 35. Finding, fixing, and destroying enemy conventional forces.

- (d) Control of civil populace in conjunction with civil affairs agencies.
 - (e) Protection of critical rear installations and lines of communication.
 - (f) Alert and warning systems, including periodic checks of all communication facilities and alerts from units and installations in the area.
 - (g) Contingency plans for all operations.
- (3) Plans should include maximum use of air vehicles to maintain air patrols between OP's, roadblocks, or other defensive positions and to airlift elements of the reserve to engage enemy elements detected by screening forces or to reinforce units in contact. Plans must allow rapid implementation but be flexible enough to satisfy several contingencies or circumstances.

d. Coordination.

- (1) *With tenant units.* The rear area security force commander is responsible for coordinating rear area security operations, in his assigned sector with all tenant unit, activity, and installation commanders. While tenants are responsible for their own local security, the rear area security force commander must coordinate with them and assist them in defense planning. Liaison must be maintained to advise the tenants of the situation and to obtain information concerning activity in the tenant area.
- (2) *With intelligence and civil affairs activities.* The rear area security force commander maintains close coordination with intelligence and civil affairs activities to obtain information concerning insurgency forces operating in the area.
- (3) *With Air Force units and Army air defense units in the area for early warning.*

e. Warning System. The successful accomplishment of a rear area security mission is contingent upon the establishment of an adequate warning system, which in turn is dependent on effective communication means. All organic,

primary, and alternate means of communication, including those of rear area units and installations, must be incorporated in the system. Procedures for reporting are established that provide for communication checks at frequent intervals at an established time employing both primary and alternate means of communication. Provisions include a means of immediately contacting those stations that do not report at the prescribed time, such as OP's, patrols, and other subordinate elements. Standby air and ground elements should be provided and dispatched immediately when a station fails to report.

395. Deployment of Rear Area Security Forces

The rear area security force may establish a defensive position. If the area to be secured is too large for employment of this method, the area is covered by observation posts and patrols with a large, highly mobile reserve prepared for immediate movement to any part of the area (fig. 36). Observation posts are sited to maintain observation over routes and installations to be secured, and usable drop or landing zones identified in the initial reconnaissance. Reserves are centrally located with regard to the vulnerable areas that are subject to airborne or ground attack. If the area is large, it may become necessary to locate the reserve in small groups throughout the area; however, the security force commander must retain control of all reserve groupings so that he can employ them separately or in mass. Air vehicles are used to maintain contact between OP's or defense positions and to conduct systematic air reconnaissance missions over the area to be secured. Ground elements establish a similar patrol system between OP's and major concentration of forces. The unit escorting convoys through threatened areas usually employs its main strength in the forward part of the formation and establishes security to the front, flanks, and rear. Air patrolling of routes will normally facilitate more rapid movement of convoys.

396. Conduct of Rear Area Defense

a. Successful defense of the rear area is contingent upon the early warning furnished by observation posts, air and ground patrols, and other security dispositions throughout the area

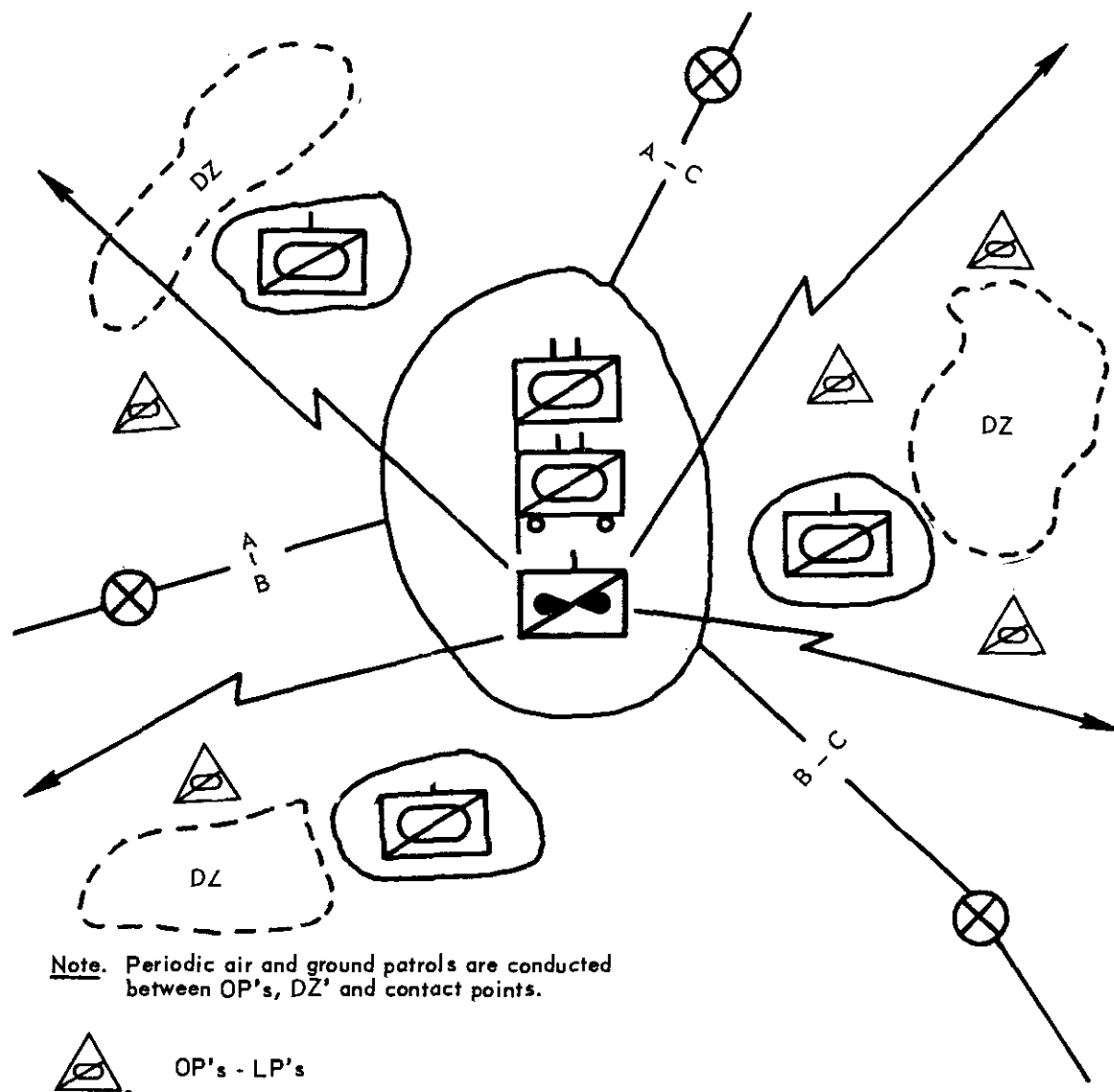


Figure 36. Armored cavalry squadron employed in rear area security mission.

(fig. 37). Care should be taken to operate air and ground patrols, and OP's or LP's on *irregular* time schedules, in varying directions and locations. Security elements, after promptly reporting the imminence of an enemy action, maintain contact with the enemy. Main forces or elements thereof are moved, as necessary, to the affected area.

b. Successful defense against an airborne or airlanded assault is based upon prompt engagement of the hostile elements by all available means. Every effort is made to attack and re-

duce the airborne or airlanded assault in the earliest stages of the drop or landing operations, when the hostile forces are most vulnerable. This immediate reaction to an airborne or airlanded attack may require the piecemeal commitment of forces, depending upon the overall disposition of the security forces at the time of the hostile attack.

c. Information pertaining to an enemy threat may be received from intelligence agencies or other sources. On receipt of such information, the commander in whose area the threat occurs takes action to reduce the threat.

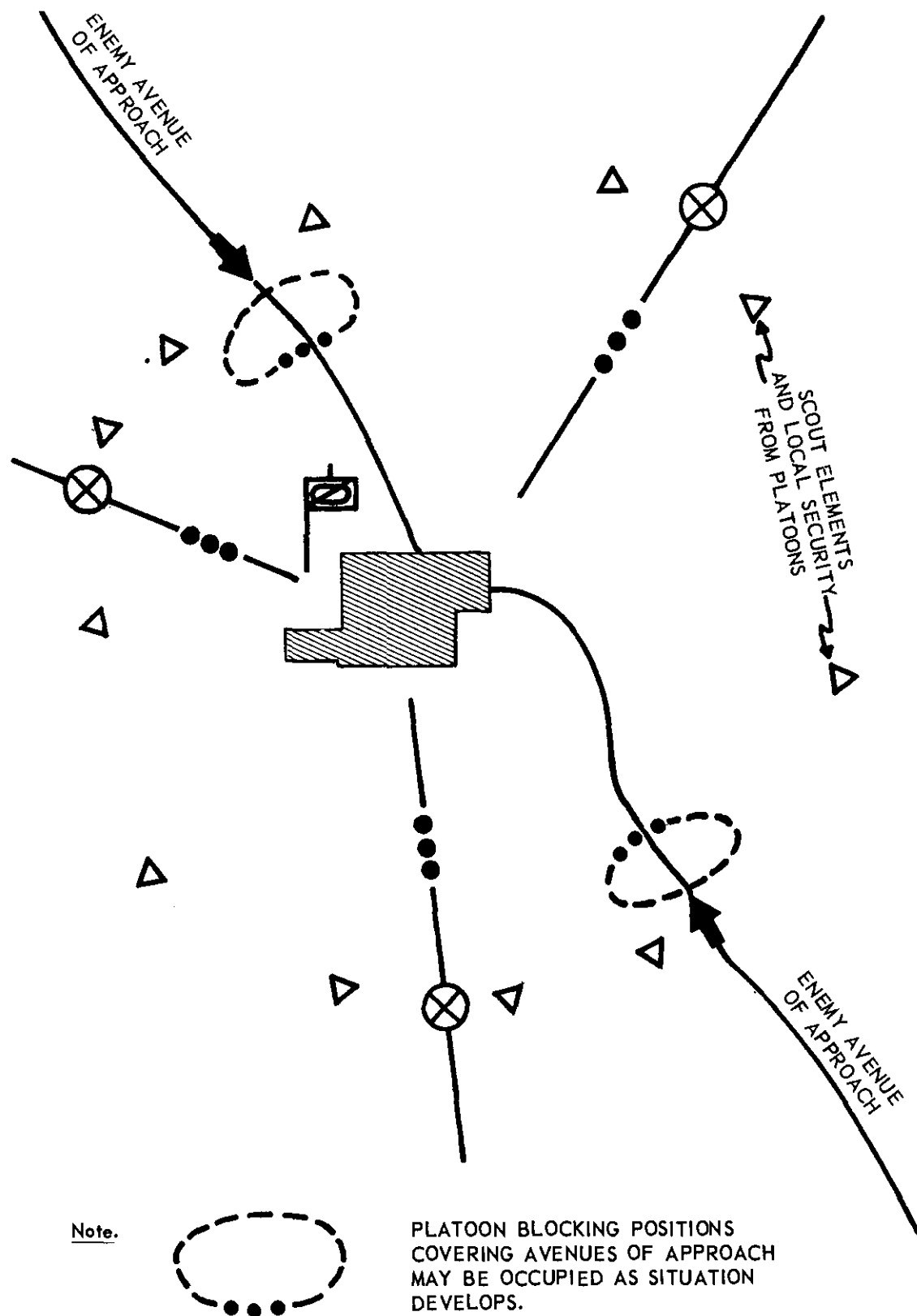


Figure 37. Armored cavalry troop protecting an installation as part of a squadron rear area security force.

APPENDIX I

REFERENCES

1. Field Manuals

FM 1-5	Army Aviation; Organizations and Employment.
FM 1-10	Army Aviation, Organizational Aircraft Maintenance and Supply.
FM 1-15	Aviation Battalion, Infantry, Airborne, Mechanized and Armored Divisions.
FM 1-60	Army Aviation, Air Traffic Operations—Tactical.
FM 1-100	Army Aviation.
FM 1-105	Army Aviation Operations.
FM 3-5	Chemical, Biological, and Radiological (CBR) Operations.
FM 3-10	Chemical and Biological Weapons Employment.
FM 3-12	Operational Aspects of Radiological Defense.
FM 5-15	Field Fortifications.
FM 5-20	Camouflage, Basic Principles and Field Camouflage.
FM 5-25	Explosives and Demolitions.
FM 5-34	Engineer Field Data.
FM 5-36	Route Reconnaissance and Classification.
FM 5-135	Engineer Battalion, Armored, Mechanized, and Infantry Divisions.
FM 5-136	Engineer Battalion, Airborne Division.
FM 6-20-1	Field Artillery Tactics.
FM 6-20-2	Field Artillery Techniques.
FM 6-135	Adjustment of Artillery Fire by the Combat Soldier.
FM 7-11	Rifle Company, Infantry, Airborne Infantry, and Mechanized Infantry.
FM 7-15	Infantry, Airborne Infantry, and Mechanized Infantry Rifle Platoons and Squads.
FM 7-20	Infantry, Airborne Infantry, and Mechanized Infantry Battalions.
FM 7-30	Infantry, Airborne, and Mechanized Division Brigades.
FM 8-15	Division Medical Service, Infantry, Airborne, Mechanized and Armored Divisions.
FM 8-35	Transportation of the Sick and Wounded.
FM 8-55	Army Medical Service Planning Guide.
FM 9-1	Ordnance Service in the Field.
FM 9-5	Ordnance Ammunition Service.
FM 9-30	Maintenance Battalion, Division Support Command.
FM 10-33	Airborne Division Quartermaster Air Equipment Support Company.
FM 10-50	Supply and Transportation Battalion, Division Support Command.
FM 10-63	Handling of Deceased Personnel in Theaters of Operations.
FM 11-50	Signal Battalion, Armored, Mechanized, and Infantry Divisions.
FM 11-57	Airborne Division, Signal Battalion.
FM 12-11	Administration Company, Airborne, Armored, Infantry, and Mechanized Divisions.
FM 17-12	Tank Gunnery.
FM 17-15	Tank Units, Platoon, Company, and Battalion.
FM 17-30	The Armored Division Brigade.

FM 17-36	Armored Cavalry Platoon and Troop, Air Cavalry Troop, and Divisional Armored Cavalry Squadron.
FM 17-95	The Armored Cavalry Regiment.
FM 19-10	Military Police Operations.
FM 19-15	Civil Disturbances and Disasters.
FM 19-40	Handling Prisoners of War.
FM 19-90	The Provost Marshal.
FM 20-32	Land Mine Warfare.
FM 20-60	Battlefield Illumination.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-10	Military Sanitation.
FM 21-11	First Aid for Soldiers.
FM 21-26	Map Reading.
FM 21-30	Military Symbols.
FM 21-40	Small Unit Procedures in Nuclear, Biological, and Chemical Warfare.
FM 21-41	Soldier Handbook for Nuclear, Biological, and Chemical Warfare.
FM 21-48	Chemical, Biological, and Nuclear Training Exercises and Integrated Training.
FM 21-50	Ranger Training and Ranger Operations.
FM 21-60	Visual Signals.
FM 21-75	Combat Training of the Individual Soldier and Patrolling.
FM 21-77	Evasion and Escape.
FM 22-100	Military Leadership.
FM 23-8	U.S. Rifle 7.62-mm, M14.
FM 23-20	Davy Crockett.
FM 23-25	Bayonet.
FM 23-30	Grenades and Pyrotechnics.
FM 23-65	Browning Machinegun, Caliber .50, HB, M2.
FM 23-67	Machinegun, 7.62-mm, M60.
FM 23-71	Rifle Marksmanship Course; Trainfire I.
FM 23-92	4.2-Inch Mortar, M30.
FM 24-18	Field Radio Techniques.
FM 26-5	Interior Guard.
FM 27-10	The Law of Land Warfare.
FM 30-5	Combat Intelligence.
FM 30-7	Combat Intelligence, Battle Group, Combat Command, and Smaller Units.
FM 30-10	Terrain Intelligence.
FM 30-101	Aggressor, the Maneuver Enemy.
FM 30-102	Handbook on Aggressor Military Forces.
FM 30-103	Aggressor Order of Battle.
FM 31-10	Barriers and Denial Operations.
FM 31-12	Army Forces in Amphibious Operations (The Army Landing Force).
FM 31-15	Operations Against Irregular Forces.
FM 31-21	Guerrilla Warfare and Special Forces Operations.
(S) FM 31-21A	Guerrilla Warfare and Special Forces Operations (U).
FM 31-25	Desert Operations.
FM 31-30	Jungle Operations.
(C) FM 31-40	Tactical Cover and Deception (U).
FM 31-50	Combat in Fortified Areas and Towns.
FM 31-60	River-Crossing Operations.
FM 31-70	Basic Cold Weather Manual.

FM 31-71	Northern Operations.
FM 31-72	Mountain Operations.
(CM) FM 32-5	Communications Security (U).
FM 41-5	Joint Manual of Civil Affairs/Military Government.
FM 54-2	Division Logistics and the Support Command.
FM 57-10	Army Forces in Joint Airborne Operations.
FM 57-35	Airmobile Operations.
FM 61-10	Command and Control Techniques.
FM 61-100	The Division.
FM 100-5	Field Service Regulations; Operations.
FM 100-10	Field Service Regulations; Administration.
FM 101-5	Staff Officers Field Manual; Staff Organization and Procedure.
FM 101-10	Staff Officers Field Manual; Organization, Technical, and Logistical Data.
(S) FM 101-31	Staff Officers Field Manual; Nuclear Weapons Employment (U).

2. Technical Manuals

TM 3-210	Fallout Prediction.
TM 21-306	Manual for the Tracked Vehicle Driver.
TM 57-210	Air Movement of Troops and Equipment.

3. Training Circulars

(S) TC 3-7	Capabilities and Employment of Biological Agents (U).
TC 3-10	Defense Against V-Agents.
TC 5-2	Employment of Mobile Assault Bridging.
TC 17-7	Aerial Surveillance Platoon, Division and Armored Cavalry Regiment.
TC 31-35	Control of Gaps.
(C) TC 100-1	Employment of Nuclear Weapons (U).

4. Regulations

AR 220-10	Preparation for Oversea Movement of Units (POM).
AR 220-58	Organization and Training for Chemical, Biological, and Radiological Operations.
AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 600-20	Army Command Policy and Procedures.

5. DA Pamphlets

DA Pam 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310-series	Military Publications Indexes.

6. Miscellaneous Publications

JCS Pub 1	Dictionary of United States Military Terms for Joint Usage.
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APPENDIX II

COMMAND FACILITIES

1. General

Command facilities include the command post and the command group.

2. Command Post

a. Purpose. The command post provides personnel and facilities for the operational control of the unit. The command post maintains communication with higher, adjacent, supporting, and lower units. It forwards reports to the command group on new developments in the situation, plans continuously for current and future operations, provides for liaison with adjacent and higher units, and supervises liaison with supporting and lower units. The command post consists of the battalion commander, the battalion staff, liaison personnel from attached and supporting units, and the necessary supporting enlisted personnel, vehicles and equipment. The command post revolves around the combined operations-intelligence section. This section uses both S2 and S3 personnel. It must be capable of continuous operations over extended periods. The executive officer supervises the command post operations and insures that sufficient officer and enlisted assistants, familiar with the situation and the operation of the headquarters, are on duty at all times. The S1 and S4 operate from the command post. "Operate" should not be construed as fixing location. For example, the S4 will be away frequently from the command post to supervise properly the logistical effort.

b. Selection of Command Post Locations. Considerations in the selection of command post locations are—

- (1) *Communication.* The command post must be in communication with all subordinate elements and higher headquarters, preferably by voice radio. For this reason the command post will usually be located to take advantage

of high ground for communication purposes. High ground other than the actual hilltop will usually provide adequate communication sites. Use of radio relay stations or available remote control equipment may allow the command post to be located on low ground with the radio facilities on high ground.

- (2) *Accessibility.* Command posts should be accessible to a road net that permits travel to subordinate elements and to higher headquarters. Generally, the command post should be near the axis of supply and evacuation. It should not be too close to crossroads, landing strips, heliports, or other prominent landmarks that might permit easy disclosure of the position by observation.
- (3) *Security.* Local security is obtained by positioning the armored vehicles on the perimeter, by assigning sectors of fire to vehicular weapons, and by establishing outposts with drivers and other available personnel. The headquarters company commander, assisted by the first sergeant, supervises local security and prepares a plan of defense using all personnel normally located in the command post (CP). The CP realizes additional security when it is positioned in proximity to combat units. The use of combat troops primarily for CP security is to be avoided.
- (4) *Cover and concealment.* The command post location should offer the best available concealment from air observation and cover from direct and indirect fires.
- (5) *Hardstanding and drainage.* The command post area must have sufficient hardstanding to support all the vehi-

cles used in the command post and in the facilities supporting the command post. Drainage must be considered since inclement weather may change radically an otherwise satisfactory area.

- (6) *Space.* The command post must provide sufficient space for adequate dispersion of vehicles and facilities.
- (7) *Displacement.* In offensive action, the command post should be located close to the forward elements, primarily to insure good communication and preclude immediate displacement. In retrograde movements, the command post is located back to the rearward limit of communication, to avoid involvement with the advancing enemy and to preclude frequent displacements as friendly elements move back.

c. Arrangement of the Command Post. The command post is arranged to facilitate work, foster security, permit concealment, and permit rapid and orderly exit. Units normally establish an SOP for the interior arrangement of the command post. The message center, located near the entrance, provides an information center and is convenient to messengers. A dismount point with parking area near the entrance prevents vehicles from moving through the command post. The operations center is located a short distance from the dismount point. The commanding officer, executive officer, S1, S4, and liaison officers are located near the operations center. Mess and maintenance facilities are grouped together, away from the operations center, so that vehicle movement is kept away from the main part of the command post. Figure 38 is a schematic diagram of the command post.

d. Movement of the Command Post. Movement of the command post should be planned to cause minimum interference with normal oper-

ation. The command post is capable of operation on the move; however, its efficiency is reduced. Often when the command group is operating, it can maintain communication and control while the main part of the command post moves. When the command group is not operating as such, a quartering party consisting of S1, S2, and S3 representatives with communication facilities may move to the new command post location and establish communication and conduct operations while the command post moves. In any event the CP does not close down.

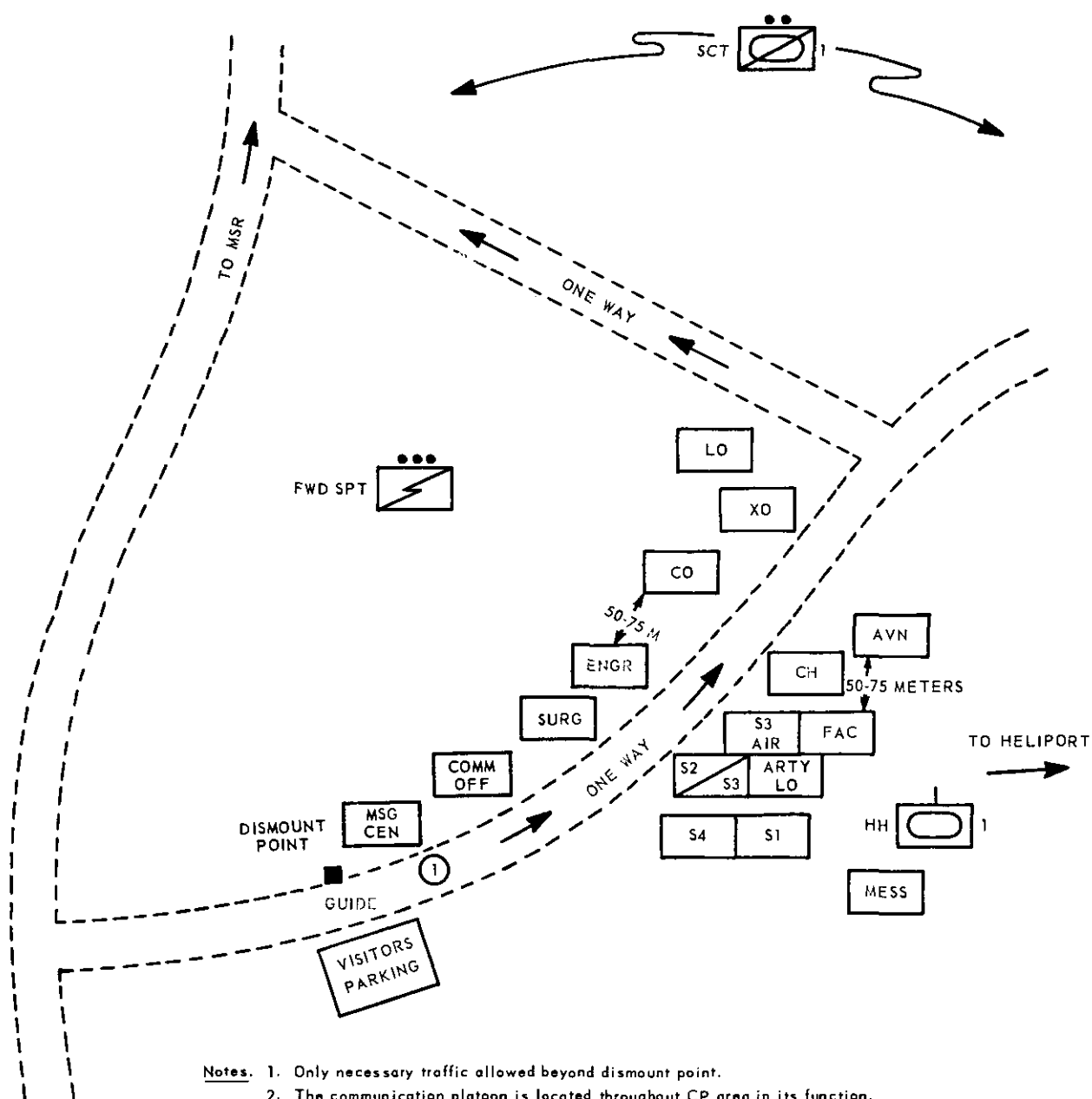
3. Command Group

a. A command group is a command and control facility, consisting of the commander and selected staff officers, signal means, and a security detachment. This group enables the commander to operate away from his command post to obtain personal knowledge of the situation, exercise personal leadership, and closely control the operation during critical periods.

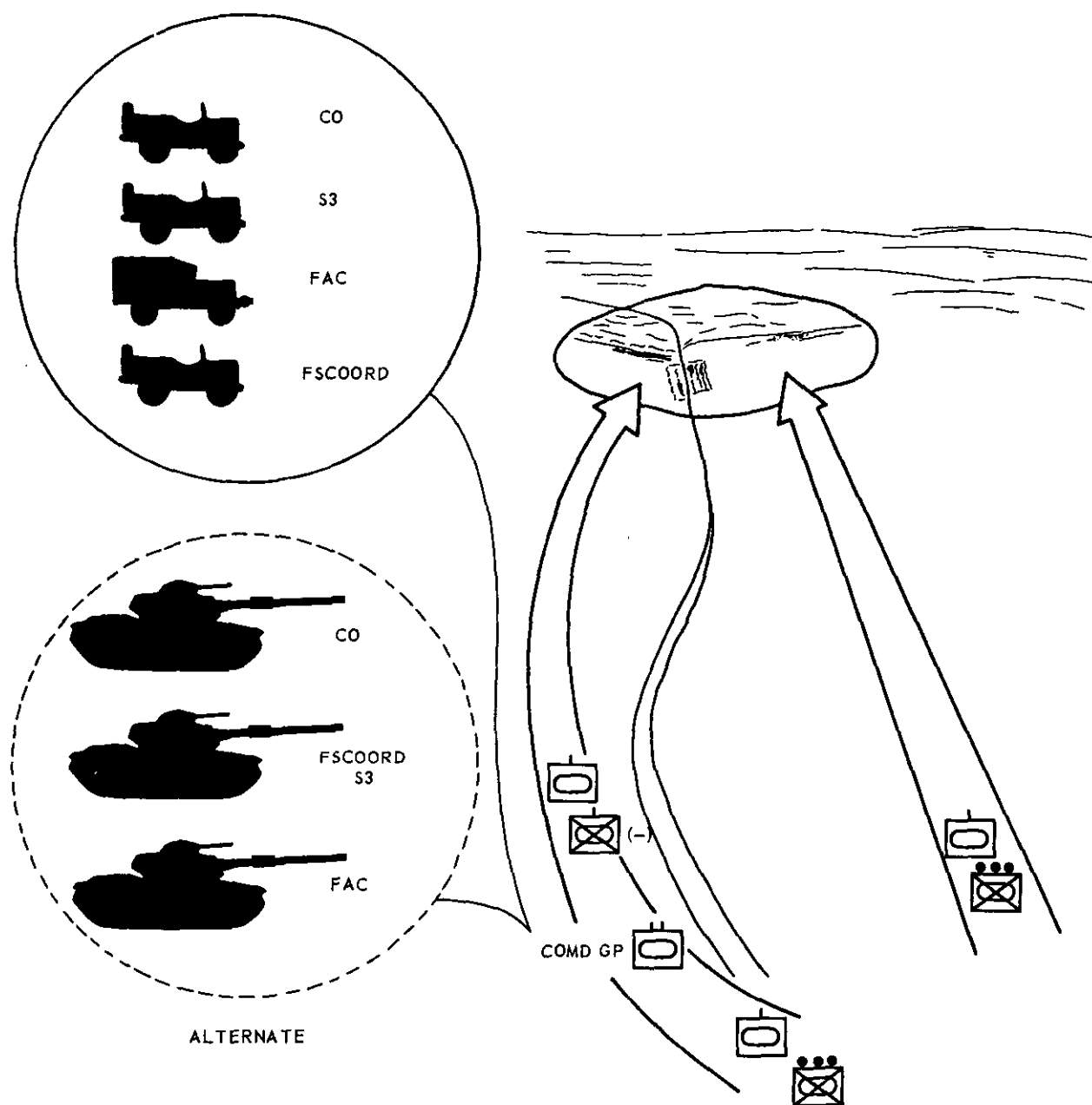
b. There is no prescribed location for the command group. The situation and the commander's personal desires affect the location. However, communication must be maintained with subordinate commanders and the command post at all times.

c. Whether the commander uses the command group will depend upon his personality and the situation. His means of transportation will vary with the situation and his personal desires. The brigade commander has a choice of helicopter, $\frac{1}{4}$ -ton truck, personnel carrier, and, if the need arises, tanks, which can be obtained from a subordinate armor unit. The battalion commander has a choice of $\frac{1}{4}$ -ton truck, tank, or personnel carrier, or helicopter if available from higher headquarters.

d. The command groups depicted in figures 39 and 40 are examples only of command groups and possible locations.

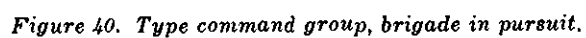


*Figure 38. Schematic diagram of a brigade CP.
A battalion CP would be disposed in a similar manner.*



In fluid situations, a battalion-size armor unit may attack on several axes of advance. The commander during a critical period can use the command group to control and supervise the operation closely.

Figure 39. Task force command group.



APPENDIX III **STAFF RELATIONS IN SELECTED OPERATIONS ACTIVITIES**

Activity	S3	S2	S1	S4	Special staff officers (attached or organic)
1. Operations, general----	Advises the commander on combat and combat support matters, and an organization and training.	Provides commander and staff with the current intelligence situation. Exercises coordinating staff supervision over all intelligence and counterintelligence activities of the command.	Advise (commander and S3) on ability to support operations, and on the impact of current and planned operations in their respective fields. Supervise combat service support operations and adjust to meet changing tactical situation as provided by S3.		All—advise appropriate staff officers on ability to support operations in their respective fields.
2. Organization -----	Maintains the troop list, including continual review and revision to insure the number and type of units attached or supporting are those that can best accomplish and support the mission. Requests attachment of combat, combat support, combat service support units or teams, attaches such units in the command in accordance with the task organization consistent with the commander's concept and the situation. Receives and processes assigned or allocated units or teams, including orientation, training, and reorganization as required.		Submit requirements to S3 for combat service support units required to support operations. Requests assignment of individuals and unit replacements.		All—submit requirements for combat and combat support units to S3. All—submit requirements for combat service support units to appropriate staff officer. All—recommended to appropriate staff officer priority and allocation of assignment of units and personnel and issue of equipment in area of interest.
3. Training -----	Prepares and supervises execution of training programs, directives, and orders; supervises the planning and conduct of field exercises. Determines requirements for, procures, and distributes, or assigns training aids and facilities.	In conjunction with S3, is responsible for intelligence training and counterintelligence training of the command. Provides S3 with requirements for training aids and areas.	In conjunction with S3 are responsible for supervision of training of the command in their respective areas of interest. Provides S3 with recommendations concerning training requirements, including type and amount. Conduct training		All—responsible to S3 for supervision of technical training of the command in their respective fields. Provide recommendations to S3 concerning need for training, including type and amount. Conduct training inspections as coordinated by S3.

Plans, conducts, and coordinates training inspections and tests. Organizes and conducts schools. Compiles training records and reports.	inspections as coordinated by S3. Submit requirements for training aids and areas to S3.	All—submit requirements for training aids and areas to S3. All—coordinate with S3 to insure training required to maintain technical proficiency of their respective units is included in the training program of the command.	inspections as coordinated by S3. Submit requirements for training aids and areas to S3.	All—submit requirements for training aids and areas to S3. All—coordinate with S3 to insure training required to maintain technical proficiency of their respective units is included in the training program of the command.
4. Operations a. Operation estimate.	Based on the commander's guidance and information received from other staff officers, prepares the operation estimate, which culminates in a recommended course of action.	Provides S3 with intelligence estimate and analysis of area of operations.	Provides S3 with intelligence estimate and analysis of area of operations.	All—provide S3 or other staff officer most concerned with advice regarding availability and capability of combat support means, and make general recommendations for employment.
b. Tactical plans. (1) General.	Conducts tactical planning, including supervision and coordination of subsidiary plans, which become component parts of the tactical plan; after command approval, publishes the operation plan or operation order. Prepares alternate operation plans as required. Insures that all plans consider the security of the command, including tactical reconnaissance, tactical cover, and deception. Establishes allocations and priorities for personnel, and supplies and equipment for combat and combat support units.	Based upon commander's decision, develops EEI and after approval by commander, submits to S3 for inclusion in operation plan. Exercises coordinating staff supervision over the preparation of the daily patrol plan. Provides S3 with continuing intelligence and makes recommendations concerning the plan as affected by the changing intelligence situation.	Based on tactical plan being developed by S3, evaluate impact to provide combat service support; advise S3 of limitations in combat service support that may affect the tactical plan; develop plans to provide required combat service support; recommend to S3 allocations and priorities for tactical units. Provides S4 with personnel entries for the operation paragraph 4 of the order and submits to S3 for inclusion in operation order.	All—provide advice and recommendations concerning employment of combat support means in their respective fields. All—recommend to appropriate staff officer allocation and priorities of personnel, supplies, and equipment to combat and combat support units of the command. All—assist S3 in planning, including preparation of specific plans for employment of their respective combat support means and preparation of parts of the overall plan.

Activity	S3	S2	S1	S4	Special staff officers (attached or organic)
(2) Fire support	Establishes the prescribed load for combat and combat support units. Supervises fire support planning. Receives the plan of fire support from the artillery officer; reviews to insure it is in consonance with command guidance and is compatible with the planned scheme of maneuver or plan of defense; integrates the plan of fire support into the operation plan.	Provides S3 with enemy capabilities and vulnerabilities; recommends target for attack by fire support means. Approves plan for monitoring fallout resulting from employment of nuclear weapons and survey of fallout areas when directed by higher headquarters. Develops potential nuclear targets and disseminates to S3 and FSCCOORD.	Provides S3 and FSCCOORD with specific areas that should be spared from attack by fire support means if tactical situation permits.	Advises S3 on current available supply rates (ASR). Insures approved plan of fire support can be supported, or notifies S3 of inability to support the plan, and makes recommendations.	Artillery—prepares the plan of fire support; reviews arty, air, and other fire plans to insure coordination; submits to S3 for review and approval. Recommends to S3 required supply rate and ASR as pertains to fire support units. Makes detailed target analyses for attacks by friendly nuclear weapons; submits to S3. Advises S3 and makes recommendations concerning employment of fire support means. Recommends to S3 organization for combat for arty. Engineer—advises S3 of requirements for support of engineer operations.
(3) Tactical cover and deception, barrier and denial, electronic warfare, and tactical reconnaissance.	In coordination with S2 and other affected staff officers, reviews tactical cover and deception, barrier and denial, electronic warfare, and tactical reconnaissance plans and reviews; integrates these plans into the operation plan.	Provides S3 with advice and recommendations concerning counterintelligence aspects. Develops counterintelligence part of plans; supervises execution. Estimates effectiveness of operations and makes appropriate recommendations to S3. Provides S3 with an estimate of enemy capabilities and activities of partisans and guerrillas.	Review impact of plans on combat service support operations; adjust to insure compatibility if possible; otherwise inform S3 of conflict and provide recommendation. Provide combat service support as directed.	All—provide S3 and S2 with advice and recommendations concerning capabilities of combat support units to support the plans. Develop detailed plans for their particular part of the overall plan.	
(4) Civil affairs	Is the commander's principal adviser on matters pertaining to the civil population in the area of operations. Submits requests for civil affairs support units to higher headquarters.	Coordinates on requests for specially trained personnel. Reviews civil affairs operation for impact on logistical support situation. Provides logistical support for civil			

c. Tactical troop movement (ground).	In coordination with S4, plans and supervises tactical troop movement, including the selection and designation of tactical units, establishment of priorities, selection of destinations, times of movement, selection of routes, security of the movement, quartering, and, as appropriate, staging, and preparation of the movement order.	Provides information of weather, terrain, and enemy situation.	Coordinates with S4 for priority of movement, CP installations.	affairs units attached or supporting. Receives requirements for transport means from S3. Provides transportation section leader with allocation of transportation. Determines priority for movement of administrative units. Exercises coordinating staff officer supervision over traffic regulations and traffic control. Insures required logistical support is provided. Coordinates with S3 for required security while in movement.	Engineer—provides S3 with road and bridge capabilities; recommends routes. Aviation—plans for providing air reconnaissance and surveillance as required. Signal—plans for providing signal communication during movement.
d. Air mobile operations	In coordination with the commanders of supporting transportation air-vehicle unit and the unit to be lifted, plans and supervises the air movement. Prepares and publishes the air movement plan, including landing zones, flight routes, loading areas, and the air movement table.	Provides S3 with weather and terrain information and enemy dispositions (including air defense) for the selection of flight routes and landing zones.	Provides S3 with data concerning status and availability of support for unit to be airlifted.	Provides S3 with data concerning status and availability of support for unit to be airlifted.	Aviation — provides assistance and technical advice to S3. Engineer—assists in preparation of landing zones. Artillery—prepares fire support plans (including suppressive in coordination with FAC) in support of airmobile operations.

Activity	S3	S2	S1	S4	Special staff officers (attached or organic)
e. General location of CP.	In coordination with the signal officer, selects the general location of the command post and affiliated command installations.	Advises on intelligence aspects.	Receives location from S3; supervises interior management of areas.		CommO—advises S3 on signal communication aspects of location. Recommends site.

APPENDIX IV

STAFF RECORDS

1. Staff Journal

The staff journal is the official, permanent, chronological record of events, information, and operations of the staff section during a stated period, normally 24 hours. It is an index of reports and messages that have been received and transmitted and of important events that have occurred. It serves as a chronological file, enabling all interested parties to locate a message or data on an event quickly and easily. Journals are permanent records and will be disposed of in accordance with AR 345-250. The journal is normally closed at 2400 hours and opened at 0001 hours daily during combat; however, it can be opened and closed at the beginning and end of periods of combat (fig. 41).

2. Staff Section Worksheet

a. A staff section worksheet is a temporary record (fig. 42) consisting of a pad or looseleaf notebook in which the staff officer enters information classified according to subjects in which he has a staff interest. When so arranged, it serves as a checklist or reminder of the types of information that should be recorded as well as providing a place to record it.

b. As the worksheet is a temporary record, when action is completed on an item, the entry can be lined out. When a worksheet is filled, it may be destroyed.

3. Sources of Information

Sources of information for the worksheet may be messages, telephone conversations, journal entries, conferences with the commander and staff officers, and information developed by the staff officers' conclusions, opinions, ideas, and inspections. When information is obtained from the journal, the journal item number of the item is entered in the worksheet preceded by the letter J to indicate that the information has been recorded in the journal.

4. Uses

The worksheet provides the staff officer with a ready reference for information to assist in preparation of estimates, plans, orders, and reports. Constant review of the worksheet may reveal problems that require further evaluation and coordination. It provides a source of information for the policy file. There is no prescribed form for a worksheet.

DAILY STAFF JOURNAL OR DUTY OFFICER'S LOG (AR 220-346 & FM 101-5)						PAGE NO. 1	NO. OF PAGES 12
ORGANIZATION OR INSTALLATION			LOCATION	PERIOD COVERED			
S2, TF 1/11 Armor			HOMBERG, Germany 282543	FROM		TO	
				HOUR	DATE	HOUR	DATE
				0001	10 Nov	2400	10 Nov
ITEM NO.	TIME		INCIDENTS, MESSAGES, ORDERS, ETC.	ACTION TAKEN		INL	
	IN	OUT					
1	0115		G2, 25th Armd Div, 2345 hrs, Air Surveil- lance Plat rept 3 entks heading SW on autobahn approx 10 K E of HERSFELD.	M-S-F-T			
2	0320		TM A, 1/11 Armor; at 0315 hrs, en ptl, est 35 atk our pos VIC COORD 420495, atk repulsed 2 PW's captured.	M-S-T-Bde 1			
3		0321	Msg above dispatched to 1st Bde.	F-S			
	*	*	* * *	*			
74			Journal closed 2400 hrs.				
LEGEND							
			M - Situation map				
			S - Staff distribution				
			T - Distribution to troops				
			F - File				
TYPED NAME AND GRADE OF OFFICER OR OFFICIAL ON DUTY				SIGNATURE			
JOHN C. DOE, Capt, Dy Off				<i>John C. Doe</i>			

DA FORM 1594
1 NOV 62

PREVIOUS EDITION OF THIS FORM IS OBSOLETE.

* U.S. GOVERNMENT PRINTING OFFICE : 1962 O-664154

Figure 41. Sample journal.

(Classification)²

S1 WORKSHEET

From: _____
hour and date

To: _____
hour and date

Headquarters: _____

Place: _____

(Classification)²

1. Strengths
2. Replacements
3. Military Personnel Procedures
4. Civilian Personnel
5. Prisoners of War
6. Morale and Personnel Services
7. Graves Registration
8. Discipline, Law and Order
9. Headquarters Management
10. Miscellaneous

- Notes.**
1. The example illustrated is one used by the S1. Worksheets used by other staff officers will be indexed to fit the needs of the particular officer.
 2. The classification will be stamped at the top and bottom of each page.

Figure 42. Staff worksheet.

APPENDIX V

REPORTS AND WARNINGS

1. General

a. This appendix prescribes the reports and warnings commonly used in armor units, illustrates forms with examples where appropriate, and outlines procedures that may facilitate the transmission of information and contribute to security.

b. The forms illustrated provide an integrated system for use from the lowest echelon through brigade/regiment level and include the majority of recurring information requirements under tactical conditions.

2. Reports

Reports are the primary source of information upon which plans and decisions are based. They must be accurate, timely, and complete. Negative information ("There is no enemy at checkpoint 40") is frequently as important as positive information. Prearranged outlines save time and contribute to completeness. Requirements for reports *must* be kept to a minimum consistent with requirements for information. The types of reports considered include—

a. Recurring reports, which are normally directed in the unit SOP include—

- (1) Periodic reports conveying the same information at prescribed intervals (hourly, daily, etc.), such as the personnel daily summary (PDS), and:
- (2) As-required reports submitted upon the occurrence of a specified event or situation, such as shelling reports (SHELREP).

b. One-time reports, which are submitted once only as directed.

3. Intelligence, Counterfire, and CBR Reports

a. *Spot Report (SPOTREP)*. This report is used as required for reporting by radio infor-

mation of the enemy and the area of operations. It is designed for use by any element that can report or relay such information. The basic items of the report normally include—

- (1) Alfa—Who is reporting
- (2) Bravo—What is being reported
- (3) Charlie—Where and when
- (4) Delta—Doing what or condition of Bravo
- (5) Echo—What you are doing

Examples of a spot report are shown at figure 43.

b. *Road, Bridge, Tunnel, Ford, or Ferry Report* (DA Forms 1248-1252). These forms are completed as required at battalion level or higher headquarters from information received in SPOTREP's of route information supplemented from other sources as necessary. They are forwarded by messenger through channels and are suitable for exchanging information with other NATO nations (FM 5-36).

c. *Shelling, Mortar, Bombing, Nuclear, and Toxic Attack Reports (SHELREP, MORTREP, BOMREP, NUCREP, and TOXREP)*. This report is used as required for reporting the indicated information rapidly by electrical means. It is initiated by the observer and transmitted through the designated channels. It may be used internationally, in NATO. The basic items of the report normally include—

- (1) Alfa—Who is reporting
- (2) Bravo—Location of observer
- (3) Charlie—Azimuth
- (4) Delta—Time of attack
- (5) Echo—Termination of attack
- (6) Foxtrot—Area attacked
- (7) Golf—Type and number of delivery means
- (8) Hotel—Nature of attack
- (9) India—Number of round
- (10) Juliett—Time flash to bang
- (11) Kilo—Damage

ENEMY INFORMATION	HIGHWAY, ROAD, TRAIL, OR CROSSCOUNTRY TRACE	BRIDGE, OVERPASS, CULVERT, OR CAUSEWAY	FORD, FERRY, OR OTHER CROSSING SITE
ALFA --Who is observer or source?* BRAVO --What? How many? How equipped?	ALFA --Who is observer or source?* BRAVO --What? Distance? Width? Surface material? Alinement (bad curves or grades)? Foundation (stable or unstable)?	ALFA --Who is observer or source?* BRAVO --What? Overall length? Width of roadway? Type and material? Spans (number and length)? Class (compute)? Clearances (overhead and horizontal)?	ALFA --Who is observer or source?* BRAVO --What? Length of crossing? Width (usable)? Bottom material? Depth or water level (present, maximum and minimum)? Speed of current? Banks or approaches (material, height, and slope)? Vessels and facilities (capacity, etc.)?
CHARLIE --Where and when?** DELTA --Doing what (if moving; direction, speed, and altitude)?	CHARLIE --Where and when?** DELTA --Condition (of surface, shoulders, and drainage)?	CHARLIE --Where and when?** DELTA --Condition? Bypass (add complete report if required)?	CHARLIE --Where and when?** DELTA --Condition (of bottom, banks, etc.)? Bypass (add complete report if required)?
ECHO --What are you doing?	ECHO --What are you doing?	ECHO --What are you doing?	ECHO --What are you doing?

*Source: the actual origin from which information is obtained, such as prisoners of war, local civilians, documents, etc.
 **Where: include from-to for route or trace of area; enemy locations sent in grid coordinates in the clear except behind friendly lines, information locating friendly units or activities in code.
 When: state either time (date-time group) of observation or duration (from-to) of activity.

(TANK COMPANY COMMANDER) THIS IS (ARTILLERY FORWARD OBSERVER)	(PLATOON LEADER) THIS IS (SECOND SCOUT SQUAD)	(ENGINEER BATTALION S2) THIS IS (ENGINEER RECONNAISSANCE TEAM ONE)	(SQUADRON S2) THIS IS (ALFA TROOP COMMANDER)
(SPOTREP) ALFA--(ARTILLERY FORWARD OBSERVER) BRAVO--FIVE AGGRESSORS WITH MACHINEGUN	(SPOTREP) ALFA--(SECOND SCOUT SQUAD) BRAVO--ROAD/FIVE METERS WIDE/CONCRETE SURFACE	(SPOTREP) ALFA--(ENGINEER RECONNAISSANCE TEAM ONE) BRAVO--BRIDGE/ONE-EIGHT METERS LONG/SIX METERS WIDE/CONCRETE SLAB/CLASS SEVEN-TWO/THREE SIX METER SPANS/CLEARANCES UNLIMITED	(SPOTREP) ALFA--(ADJACENT UNIT CONTACT PARTY) BRAVO--FORD/SIX-FIVE METERS LONG/ONE-TWO METERS WIDE/ROCK BOTTOM/ ONE-HALF METER DEEP/ CURRENT SLOW/APPROACHES TWO-ZERO PERCENT GRAVEL BOTH SIDES
CHARLIE--COORDINATES MIKE-BRAVO-NINER-EIGHT-FIVE-FIVE-NINER-ONE/TIME TWO-FIVE-ONE-SEVEN-FOUR-TWO DELTA--DUG IN/FIRING	CHARLIE--FROM CHECKPOINT ONE-NINER TO CHECKPOINT SIX-ONE/TIME TWO-FIVE-ZERO-NINER-FIVE-ZERO DELTA--GOOD CONDITION/ SUITABLE FOR USE BY (FIRST BRIGADE)/NO ENEMY CONTACT	CHARLIE--COORDINATES (MIKE-ALFA-EIGHT-SIX-SIX-NINER-SIX-FIVE)/TIME TWO-FIVE-ONE-ZERO-ZERO-ZERO DELTA--GOOD CONDITION/NO BYPASS WITHIN FIVE-HUNDRED METERS/NO ENEMY	CHARLIE--FROM CHECKPOINT TWO-NINER DOWN THREE-HUNDRED RIGHT ONE-FIVE-ZERO/TIME TWO-FIVE-ZERO-SIX-ZERO-ZERO DELTA--GOOD CONDITION/NO ENEMY
ECHO--CAN FIRE IF YOU DESIRE	ECHO--CONTINUING TOWARD CHECKPOINT EIGHT-EIGHT	ECHO--RETURNING TO YOUR LOCATION WITH MORE INFORMATION	ECHO--CONTINUING MISSION
OVER	OVER	OVER	OVER

Figure 43. SPOTREP originating or used at company/troop/battery level and below.

- (12) Lima—Fireball width (NUCREP only)
 (13) Mike—Cloud height (NUCREP only)
 (14) November—Cloud width (NUCREP only)

Examples are shown at figure 44.

d. *Report of Isolated Radiation Dose-Rate Measurement.* This report is used as required by radiological monitoring (RADLMON) or survey (RADLSV) parties and above to report, electrically, data obtained. RADLMON

information is normally reported through command channels to division and RADLSV data as directed. DA Forms 1971-R (Data Sheet for Radiological Survey-Ground) and 1971-1-R (Data Sheet for Radiological Survey-Aerial) may be used and the data recorded is reported, using this report. The report is suitable for exchanging information within NATO. The basic items of the report normally include—

- (1) Alfa—Time of report
- (2) Quebec—Location of reading

ITEM MEANING

(Omit items not applicable; state units of measure used, such as meters, mils, etc.)

ALFA--FROM (unit call sign)

BRAVO--POSITION OF OBSERVER (in grid coordinates in code)

CHARLIE--AZIMUTH OF FLASH (or SOUND or GROOVE OF SHELL - state which) (or ORIGIN OF FLIGHT PATH of missile)

DELTA--TIME FROM/DATE-TIME OF ATTACK

ECHO--TIME TO (or ILLUMINATION TIME)

FOXTROT--AREA ATTACKED (either azimuth and distance from observer in code or grid coordinates in the clear)

GOLF--NUMBER AND NATURE OF GUNS, MORTARS, AIRCRAFT, OR OTHER MEANS OF DELIVERY

HOTEL--NATURE OF FIRE (barrage, registration, etc.) (or TYPE OF BURST - air or surface - NUCREP only) (or TYPE OF TOXIC AGENT)

INDIA--NUMBER AND TYPE OF BOMBS, SHELLS, ROCKETS, ETC.

JULIETT--TIME FLASH-TO-BANG (of weapon)

KILO--DAMAGE (in code) (or CRATER DIAMETER--NUCREP only)

LIMA--FIREBALL WIDTH (immediately after shock wave passage) NUCREP only

MIKE--CLOUD HEIGHT (top or bottom--state which) (10 minutes after burst) NUCREP only

NOVEMBER--CLOUD WIDTH (10 minutes after burst) NUCREP only

(BATTALION S2) THIS IS (BRAVO COMPANY COMMANDER) (SHELREP)

ALFA--(FIRST PLATOON BRAVO COMPANY)

BRAVO--(MIKE-BRAVO-TWO-ONE-SIX-EIGHT-FIVE-EIGHT)

CHARLIE--MAGNETIC AZIMUTH GROOVE OF SHELLS NINER-SIX DEGREES APPROXIMATE

DELTA--ZERO-NINER-ONE-SIX-TWO-FIVE

ECHO--ONE-SIX-FOUR-FIVE

FOXTROT--SAME AS BRAVO

GOLF--ESTIMATE FOUR ONE-FIVE-TWO MILLIMETER HOWITZERS

HOTEL--HARASSMENT

INDIA--TWO-FOUR ROUNDS HIGH EXPLOSIVE

KILO--NEGLECTIBLE

OVER

(BRIGADE S2) THIS IS (TANK BATTALION S2) (NUCREP)

ALFA--(ALFA COMPANY)

BRAVO--VICINITY (MIKE-BRAVO-TWO-NINER-SIX-THREE)

DELTA--ZERO-TWO-ZERO-FOUR-FIVE-ZERO

ECHO--ILLUMINATION TIME FOUR SECONDS

FOXTROT--VICINITY MIKE-BRAVO-TWO-ZERO-SIX-TWO

HOTEL--AIR BURST

INDIA--ONE ROUND TYPE UNKNOWN SMALL YIELD

KILO--(SEVERE FLASH BLINDNESS THROUGHOUT AREA OTHER DAMAGE UNKNOWN AT THIS TIME)

LIMA--TWO-FIVE-ZERO METERS ESTIMATED

MIKE--TOP TWO-SEVEN-HUNDRED METERS ESTIMATED

NOVEMBER--ONE-THOUSAND METERS ESTIMATED OVER

Figure 44. Forms originating or used at company/troop/battery level and below.

(3) Romeo—Intensity

(4) Sierra—Time of reading

Examples are shown at figure 45.

e. Report of Enemy Use of Toxic Agents (DA Form 890). (See FM 21-20.) This is a report submitted by each company-size unit after toxic attack in accordance with pertinent instructions.

f. Intelligence Summary (ISUM). This is a periodic summary of the significant information developed from all sources by a battalion-level or higher unit for a period specified by SOP. It is prepared by the S2 and distributed electrically or by messenger through intelligence channels to higher, lower, and adjacent units. Examples are shown in figure 46.

4. Operations Reports

a. Unit Situation/Status Report (STATREP). This report covers the tactical

situation and status of a unit below battalion level. It is submitted to the battalion/squadron operations center. The complete report is normally rendered by radio or messenger upon seizure of an objective, closing in an assembly area, immediately after a nuclear strike, and in other similar instances or as required by SOP (at least daily). A fragmentary report is submitted by radio periodically (usually every hour) during tactical operations. The complete report may be required whenever a company, troop, or platoon is newly attached to another headquarters. Information is collected and transcribed from this report at battalion or comparable level for inclusion in required reports (fig. 47).

b. Situation Report (SITREP) (FM 101-5). This is periodic report forwarded electrically or by messenger by battalion-level and higher units summarizing the tactical situation for a period specified in the SOP.

REPORT OF ISOLATED RADIATION DOSE-RATE MEASUREMENT

ITEM MEANING

ALFA --Report time <u> (DTG) </u> .	(ALFA COMPANY COMMANDER) THIS IS (MONITERING PARTY ONE)
QUEBEC* --Location of reading.	(RADIATION DOSE RATE) TWO-ZERO- ONE-EIGHT-ZERO-ZERO QUEBEC --COORDINATES LIMA- BRAVO-ONE-TWO-THREE-NINER- EIGHT-TWO
ROMEO* --Intensity** (rad per hour).***	ROMEO --TWO-SEVEN INCREASING
SIERRA* --DTG of reading.	SIERRA --TWO-ZERO-ONE-SEVEN- FIVE-SEVEN

OVER

*Repeat items as often as necessary.

**Intensities measured in the open, one meter above ground, or as directed.

***The words INITIAL, INCREASING, or DECREASING may be added.

Figure 45. Report of isolated radiation dose-rate measurement originating or used at company/troop/battery level or below.

c. Command Report (FM 101-5). This is detailed formal written report submitted usually monthly by battalion-level and higher headquarters. It covers all aspects of a unit's activities for historical purposes.

d. Minefield Reports (FM 20-32). Reports of intent to lay mines are submitted as required and should include—

- (1) Location and extent of the minefield.
- (2) Estimated time of completion.
- (3) Number and type of mines.
- (4) Tactical purpose of the field.
- (5) General location of lanes and gaps.

Reports of initiation and completion of laying and of transfer, change, and removal are forwarded as appropriate by units taking such

action. DA Form 1355 (Minefield Record) will be completed and forwarded in addition to these reports.

5. Administrative Reports

a. Unit Situation/Status Report (STAT-REP) (fig. 47). The complete report provides most of the information required of subordinate units by battalion/squadron to prepare the following administrative reports:

- (1) Personnel daily summary (PDS).
- (2) Daily battle loss equipment report.
- (3) Combat vehicle daily status report.
- (4) Periodic logistics report.

It serves also as the basis for POL and ammunition requests.

FORMAT

(Omit items not applicable unless otherwise indicated)

1. Issuing unit.
2. Time and date of issue.
3. Summary of enemy activity for period:
 - a. Ground activity.
 - b. Trace of forward elements.
 - c. Potential targets for nuclear weapons.
 - d. Air activity.
 - e. Nuclear activity.
 - f. Other (new tactics, counterintelligence, etc.)
4. Personnel and equipment losses:
 - a. Personnel (KIA, WIA).
 - b. Prisoners of war.
 - c. Equipment destroyed or captured.
5. New obstacles and barriers.
6. Administrative activities.
7. New identifications:
 - a. Units.
 - b. Personalities.
8. Enemy movements.
9. Estimates number and types of vehicles.
10. Weather and terrain conditions.
11. Brief discussion of capabilities and vulnerabilities (always included).
12. Conclusions (always included).

EXAMPLE

(FIRST BRIGADE S2) THIS IS (TASK FORCE TWO-SLASH-NINER-ONE MECHANIZED) (ISUM) ONE--TASK FORCE TWO-SLASH-NINER-ONE MECHANIZED) TWO--ZERO-TWO-ONE-SIX-ZERO-ZERO-ALFA THREE ALFA--PLATOON STRENGTH PROBING ATTACKS AT MIKE-BRAVO-TWO-ONE-SEVEN-NINER-NINER-TWO TIME ONE-FOUR-FIVE-ZERO AND AT MIKE-BRAVO-TWO-TWO-ONE-NINER-NINER-THREE TIME ONE-FIVE-ONE-FIVE THREE BRAVO--NO CHANGE THREE DELTA--TWO JET FIGHTER-BOMBER AIRCRAFT ATTACKED (TEAM CHARLIE) AT MIKE-BRAVO-TWO-ONE-ZERO-NINER-NINER-FIVE TIME ONE-FOUR-FIVE-FIVE WITH CANNON AND ROCKETS FOUR ALFA--ESTIMATE ONE-ZERO KILLED AND TWO-ZERO WOUNDED FOUR CHARLIE--TWO PERSONNEL CARRIERS AND ONE MEDIUM TANK DESTROYED

SIX--SUSPECTED BATTALION LEVEL SUPPLY POINT AT MIKE-BRAVO-TWO-SIX-EIGHT-NINER-NINER-TWO

EIGHT--ESTIMATED REINFORCED TANK COMPANY MOVING NORTH ON ROAD FROM VICINITY MIKE-BRAVO-TWO-SEVEN-TWO-NINER-NINER-EIGHT AT ONE-TWO KILOMETERS PER HOUR ESTIMATED TIME ONE-FIVE-TWO-FIVE NINER--NO CHANGE ONE-ZERO--NO CHANGE ONE-ONE--ENEMY CAPABLE OF ATTACKING IN REINFORCED COMPANY STRENGTH IN SECTOR PRIOR TO ONE-NINER-ZERO-ZERO ONE-TWO--EXPECT REINFORCED COMPANY STRENGTH ATTACK IN SECTOR PRIOR TO ONE-NINER-ZERO-ZERO AND INCREASING PRESSURE THROUGHOUT NIGHT OVER

Figure 46. ISUM originating or used at battalion/squadron level and above.

ITEM MEANING	FRAGMENTARY	COMPLETE
Report as of (DTG) .	(COMPANY COMMANDER) THIS IS (FIRST PLATOON LEADER) (STATREP) TWO-SEVEN-ONE-FOUR-ZERO-ZERO	(BATTALION OPERATIONS) THIS IS (CHARLIE COMPANY COMMANDER) (STATREP) ONE-FOUR-ZERO-FOUR-ZERO-ZERO
ALFA*--REPORTING UNIT (call sign) BRAVO*--LOCATIONS Company/troop report locations of immediate subordinate elements, command post, airstrip/heliport, trains, and observation post and radar site location and primary sector.	ALFA--(FIRST PLATOON) BRAVO--COORDINATES (MIKE-BRAVO-SIX-SEVEN-FIVE-TWO-TWO-THREE)	ALFA--(CHARLIE COMPANY) BRAVO--(FIRST PLATOON) COORDINATES (MIKE-ALFA-ONE-EIGHT-TWO-FIVE-SIX-EIGHT) TO (ONE-EIGHT-SEVEN-FIVE-SIX-SEVEN)/(SECOND PLATOON) (ONE-EIGHT-SEVEN-FIVE-SIX-FIVE) TO (ONE-EIGHT-NINER-FIVE-SIX-TWO)/(THIRD PLATOON) (ONE-NINER-ZERO-FIVE-FIVE-NINER) TO (ONE-NINER-TWO-FIVE-FIVE-FIVE)/(COMMAND POST) (ONE-EIGHT-FOUR-FIVE-SIX-TWO)/(TRAINS) (ONE-EIGHT-ZERO-FIVE-SIX-ONE)/(OBSERVATION POST ONE) (ONE-EIGHT-NINER-FIVE-SIX-NINER)/(OBSERVATION POST TWO) (TWO-ZERO-EIGHT-FIVE-FIVE-NINER)/(RADAR) (ONE-EIGHT-EIGHT-FIVE-SIX-THREE PRIMARY SECTOR AZIMUTH ONE-ONE-EIGHT-ZERO MILS)
Platoons report only center of mass or front line trace and observation post locations.		CHARLIE--(ALL ELEMENTS CLOSED IN POSITION ONE-FOUR-ZERO-FOUR-FOUR-EIGHT RECEIVING SPORADIC ARTILLERY FIRE DELTA--ONE-THREE-ONE-EIGHT-ZERO-ZERO DELTA TWO--(ONE) DELTA FIVE--(ONE)
CHARLIE*--ACTIVITY Brief summary of activity since last report.	CHARLIE--CONTINUING ATTACK	
DELTA--PERSONNEL*** Losses since (DTG) (in code): DELTA ONE--Killed in action. DELTA TWO--Wounded in action DELTA THREE--Missing in action. DELTA FOUR--Captured. DELTA FIVE--Nonbattle casualties. DELTA SIX--Administrative losses. ECHO--AMMUNITION Total ammunition required to replenish basic load (in code).		ECHO--NEGATIVE
FOXTROT--FUEL Total fuel required in gallons by type (in code). GOLF--EQUIPMENT Total vehicles and designated major items short; include all items not immediately available for action ** (in code).		FOXTROT--(ONE-TWO-HUNDRED DIESEL FIVE-HUNDRED MOGAS) GOLF--(ONE ONE-QUARTER-TON TRUCK)
HOTEL--REMARKS Any additional information required to complete the situation/status picture. Omit if not required.	HOTEL--TWO PAPA WHISKEY LEFT GUARDED AT CHECKPOINT TWO-TWO OVER	HOTEL--IN CONTACT WITH (BRAVO COMPANY) AT CONTACT POINT FIVE-NINER (SHELREP) FOLLOWS WAIT

*Indicates items of fragmentary report.

**See unit SOP for detailed method of reporting.

***For initial report upon attachment only send complete PDS.

Figure 47. Situation/status report originating or used at company/troop/battery level and below.

b. *Personnel Daily Summary (PDS)* (FM 101-5). This request provides a detailed summary of an organization's personnel status as of the time of submission and is forwarded daily by battalion-level units as directed. The PDS is prepared from information received in STATREP's from subordinate units and from other sources (S3 for task organization, etc.).

c. *Morning Report (DA Form 1)* (AR 335-60). The morning report is normally prepared under tactical conditions by personnel services elements of the division, separate brigade, group, or regiment. Information for the morning report is obtained from a feeder report submitted daily by each company-size unit.

d. *Casualty Report (DA Form 1154)* (AR 600-65). The casualty report is prepared by personnel services elements from data furnished on DA Form 1156 (Casualty Report Feeder Report) substantiated as required by DA Form 1155 (Witness Statement). Forms 1155 and 1156 are completed as soon as possible after the incident. They are normally prepared by the squad leader or tank commander and witnesses.

e. *Daily Battle Loss Equipment Report*. This periodic report is prepared by the S4 at battalion or comparable level using information from STATREP's of subordinate elements and from the supply, maintenance, and communication officers. It is submitted as directed and reports the loss of major or critical items of equipment. The best method of reporting is by TOE line item number (encoded if trans-

mitted electrically). The report serves as an automatic requisition when authorized by field army; therefore a loss is to be reported once only.

f. *Combat Vehicle Daily Status Report* (FM 101-5). This report is submitted by battalion-level units daily and reflects the detailed status of combat vehicles. It is normally prepared by the S4 from information received in lower unit's STATREP's and from the maintenance officer.

g. *Periodic Logistics Report* (FM 101-5). This report is submitted as required by battalion and higher-level units covering in detail the status of all categories of logistics in the unit. It is normally required of a unit upon attachment to a new headquarters.

h. *Special Logistics Reports*. These are one-time reports forwarded as directed giving detailed information of a specific category of logistics or type of equipment.

6. Warnings

Warnings are messages giving information of an impending threat or dangerous condition. They must be disseminated rapidly to higher, lower, and adjacent elements. Prearranged warning messages giving only essential information provide the most rapid means of dissemination and contribute to complete understanding. The SPOTREP report and some of the CBR reports (par. 3) are suitable for use as warnings in appropriate situations.

APPENDIX VI

MOVEMENTS

Section I. GENERAL

1. Purpose

The purpose of a movement is to relocate a unit to arrive at the appointed time and place with all personnel and equipment ready to accomplish the mission. This appendix outlines the techniques and methods employed in moving armor units.

2. Classification

Movements are classified as either tactical or administrative. They may be classified further by the method used to move the unit. Of these methods, armor units are concerned with movements by motor, rail, air, and water.

a. Administrative. An administrative move is conducted with primary consideration on the rapid transit of units and vehicles. This type of movement is made when contact with the enemy is remote. The integrity of units is maintained whenever practicable.

b. Tactical. A tactical move is one conducted with primary emphasis on movement in combat-ready formations. In a tactical move, units, vehicles, and equipment are arranged to facilitate their employment upon contact with, or interference from, the enemy. The main factors influencing dispositions for the tactical move are the composition and nearness of hostile forces, and the plan of action upon arrival at the destination. Under these conditions, tactical considerations often preclude the most efficient use of transportation means.

3. Control and Coordination

Control requires proper organization of the force for movement; staff agencies to plan and supervise the movement; use of control measures; and communication. Proper organization for movement requires that the force be subdivided into manageable echelons and unit

integrity be maintained consistent with the tactical situation. A movement group when composed of troops from more than one unit should have a single commander designated. Subgroups should be composed of units under their own commanders.

4. Planning

Movement planning consists of three steps, which may be accomplished jointly and continuously. These steps are determination of requirements for the move, analysis of organic and nonorganic movement capabilities, and establishment of priorities for units in the movement. The following factors are considered in movement planning:

a. Organization of units and their equipment.

b. Assembly of units and transportation means.

c. Packing and marking of equipment and loading personnel and equipment.

d. Control, coordination, and administrative support for the movement and at the destination.

e. Assembly of units and equipment at the destination.

f. Security measures before and during movement, and at destination.

g. Enemy situation, geographic conditions, and weather.

5. Orders

Movement orders are usually preceded by a warning order. The information given in the warning order includes the destination, time and date of departure, and other essential information. Movement orders follow the general format of the operation order. They are based on the movement plan and unit SOP.

Section II. MARCHES

6. Movement Terms

a. Arrival Time. The time at which the head of the column arrives at a designated point.

b. Clearance Time. The time at which the tail of a column passes a designated point.

c. Close Column. A column in which each vehicle is closed to safe driving distance behind the preceding vehicle. Armor units in close column normally use a density of approximately 30 vehicles per kilometer, with an intervehicular distance of 25 meters per vehicle.

d. Control Vehicle. The vehicle traveling at the head of a column and setting the speed of the column to maintain the prescribed rate of march.

e. Critical Point. Point on a route of march where difficulties in executing a march are anticipated.

f. Density. The average number of vehicles or persons occupying 1 kilometer of road space.

g. Distance. The space between units, measured from the rear of one unit to the front of the following unit in the column, expressed in meters or kilometers.

h. Guide. A person who leads a unit or vehicle over a predetermined route or to a selected area, or a person posted along the route of march to direct traffic.

i. Infiltration. Movement of vehicles, singly or in small groups.

j. Intervehicular Distance. The space between vehicles measured from the rear of one vehicle (including towed load if any) to front of the following vehicle in the column. It is expressed in meters.

k. Start Point (SP). Point (e.g., a crossroads) at which a foot march or motor movement is formed, without halting, by the successive arrival of the units that make up the column.

l. Light Line. A theoretical line on the ground beyond which vehicles moving to the front at night are required to use blackout markers, or beyond which vehicles moving to the rear are required to operate with driving lights on.

m. March Column. The elements using the same route for a single movement.

n. March Discipline. Observance and enforcement of the rules governing a unit on the march.

o. Road Movement Graph. Time-spaced diagram used in planning and controlling marches, both road and foot, and in preparing or checking road movement tables.

p. March Order. An operation order issued by a commander to give instructions for a march.

q. Road Movement Table. A composite list showing the general organization and time-space schedule for a march movement. It is generally published as an annex to an operation order.

r. March Unit. A unit or group of units that moves or halts at the order of a single commander. A platoon, company, or similar organization normally forms the march unit. A serial is made up of one or more march units.

s. Open Column. A column in which distances between vehicles are increased to accomplish greater dispersion. Armor units in open column normally use a density of approximately 15 vehicles per kilometer or greater if conditions require when marching at an intervehicular distance of 50 meters per vehicle.

t. Quartering Party. A variable group of persons representing each unit in the march column. It is dispatched before the main body to reconnoiter and plan for the occupation of the new area. It may post guides to direct or lead elements of the main body.

u. Rate of March. The average marching speed in kilometers per hour, including scheduled halts.

v. Release Point (RP). A location at which the units of a march column revert to control of their respective commanders.

w. Road Space. The length of roadway, in kilometers, occupied by an element of the march column.

x. Serial. One or more march units, preferably with the same march characteristics, placed under 1 commander for march column. A battalion normally forms a march serial.

y. Strip Map. Sketch of a route of march. It may or may not be drawn to scale, but should include identifying landmarks (that is, towns,

bridges, or crossroads) with the distance between them expressed in kilometers.

z. Time Distance. The time required to move from one point to another at a given rate of march.

aa. Time Interval. It is applied in the amount of time between march units, serials, or columns as they move past a given point. The time is measured from the instance the tail of one unit clears the point to the instant the head of the following unit reaches the same point.

ab. Time Length. The time required for a column or elements thereof to pass a given point.

7. Types of March Columns

a. Open Column. The open column is normally used in tactical marches made during daylight. It may be used when the unit moves at night with driving lights on, or moves on moonlit nights on good routes with blackout lights on. The open column provides the best compromise between the conflicting requirements for a short time-length and for dispersion.

b. Close Column. The close column is normally used in tactical and administrative marches during hours of darkness under blackout driving conditions. This method of marching takes maximum advantage of the traffic capacity of the routes. However, it does not provide dispersion. In daylight, a distance of approximately 25 meters between vehicles is prescribed. At night, the distance between vehicles is such as will enable the driver to see two lights in the blackout marker of the preceding vehicle.

c. Infiltration. Infiltration may be used on tactical marches when sufficient time and road space are available and maximum secrecy, deception, and dispersion are desired. Because of extended distance between vehicles, column control is extremely difficult, and routes must be marked carefully in advance to prevent drivers from becoming lost.

8. Planning the March

Factors to consider in planning are—

a. Enemy situation.

b. Routes of march.

c. Reconnaissance.

d. Quartering party.

e. Organization of the march column.

f. Determination of critical points (i.e., SP, RP, defiles).

g. March distances.

h. Control and supervision of the march.

i. Halts.

j. Security measures.

k. Logistical support.

l. Establishment of necessary liaison.

m. Issuance of maps and orders.

9. Organization of the March Column

a. The organization of the march column for the tactical march is governed primarily by the tactical situation and the order in which it is desired that subordinate units arrive at a given location. Other considerations are the time of the move and the march characteristics of the marching units. When the tactical situation demands that a column be composed of vehicles of different characteristics, the rate of march is based on the slowest vehicle.

b. The number of columns that a unit employs depends on the availability of routes and the situation. The use of one march column facilitates control, but increases the time length of the unit. The use of multiple march columns makes control more difficult, but decreases the amount of time required for the movement.

10. Road Movement Table

The road movement table includes the route, rate of march, and times of arrival and clearance at the destination and at critical points along the route. Determination of these times is based on the route space occupied by each unit and the time required for the unit to pass a given point at a uniform rate of march (time length) and the distance (time interval) between march units and serials (fig. 48). The road movement table may be issued as an annex to the operation order.

11. March Routes

Higher headquarters usually designates march routes for both road and cross-country

EXAMPLE: TANK BATTALION OF 180 VEHICLES IS MOVING IN OPEN COLUMN (DENSITY--15 VEH) AT A RATE OF MARCH OF 20 KPH. THE BATTALION IS MOVING IN 4 MARCH UNITS WITH 3 MINUTES BETWEEN MARCH UNITS. WHAT IS THE TOTAL TIME LENGTH OF THE BATTALION?

RATE OF MARCH--20 KPH.			
Hq Co	Co C	Co B	Co A
TIME INTERVAL--3 MINUTES			
ROAD SPACE			
TO DETERMINE ROAD SPACE:			
$\frac{\text{NO. OF VEHICLES}}{\text{DENSITY}} + \frac{\text{TIME INTERVAL (MIN.)} \times \text{RATE (KPH.)}}{60} = \text{ROAD SPACE}$			
$\frac{180}{15} + \frac{9 \times 20}{60} = \text{ROAD SPACE}$			
$12 + 3 = \text{ROAD SPACE}$			
$\text{ROAD SPACE} = 15 \text{ KILOMETERS}$			
TO DETERMINE TIME LENGTH:			
$\frac{\text{ROAD SPACE (KILOMETERS)} \times 60}{\text{RATE (KPH.)}} = \text{TIME LENGTH}$			
$\frac{15 \times 60}{20} = \text{TIME LENGTH}$			
$\text{TIME LENGTH} = 45 \text{ MINUTES}$			

Figure 48. Procedure for computing road space and time length of column.

marches. Higher headquarters may establish a route priority and schedule for the march.

12. Reconnaissance of March Route

The reconnaissance should provide information about critical points and route characteristics specifically—

- a. The type, condition, and width of routes.
- b. The capacity and location of bridges and bypasses.
- c. The location of fords, depth of water, and condition of bottom, banks, and approaches.
- d. Defiles, congested areas, or obstacles that may result in excessive concentration of marching elements and creation of a possible nuclear target.
- e. Location of "coil up," feeding, or fueling areas if their use is contemplated.

13. Quartering Party

- a. A quartering party should precede the main body whenever possible. The quartering

party is composed of representatives of all subordinate units. Its mission is to thoroughly reconnoiter the new area and to make necessary improvements on entrances to, and routes in the area. The commander of the quartering party should be informed of the route, order of march, and estimated time of arrival of the main body.

- b. It is desirable that the same individuals be employed regularly on quartering party assignments, and be trained in mine detection and removal. The quartering party may be furnished with guides and markers and with pioneer tools to make improvements in the area.

14. Start Point

- a. The start point (SP) is a common point from which all units start their march according to a predetermined time-table. Each unit must be traveling at the prescribed speed, and with the prescribed time and ground distances, when it reaches this point.

- b. Each march unit or serial commander is responsible for a reconnaissance of the route to the SP. Commanders using the same route must coordinate their actions to insure an uninterrupted advance to and across the SP.

15. Release Point

The release point (RP) is the point at which an incoming serial or march unit is released from column control. The serial or march unit separates from the column, and is led by guides from the quartering party into its assigned area. Serials and march units must clear the RP at the designated rate of march.

16. Rate of March

- a. The rates of march for mixed columns of tanks, armored personnel carriers, and wheeled vehicles for sustained periods vary as follows:

- (1) During daylight—10 to 30 kilometers per hour (6–20 miles per hour).
- (2) During darkness—7 to 15 kilometers per hour (4–10 miles per hour).

- b. The factors to consider in determining the exact rate of march are—

- (1) Grades, sharp turns, cities, towns, and other restrictions along the route.
- (2) Surface conditions such as dust, ice, permafrost, mud, and snow.
- (3) Condition of vehicles.
- (4) Condition of drivers and crews.
- (5) State of march training and degree of experience of individuals and units.
- (6) Weather conditions that affect visibility.
- (7) Light conditions that affect visibility.
- (8) The maximum sustained speed of the slowest vehicle.

17. March Distance

a. The intervehicular distance in a march column is determined by the selection of the type column to be employed.

b. The distance between elements of the column expressed as a time interval is announced usually by the commander. For planning purposes, the time interval is generally 3 minutes between march units and 5 minutes between task force serials.

18. Control and Coordination

a. General.

- (1) A high degree of march training and discipline is the greatest factor in successful control of the unit on the march. March orders must be clear and complete. Commanders and staff officers must supervise the march to insure strict compliance with the control measures announced in the march order. They may use ground and air vehicles, radio, route markings, guides and military police to assist them in control and coordination of the march.
- (2) When radio silence is in effect, or to supplement radios, visual signals are used extensively for column and vehicle control. Messengers are used between units in the column, and guides may be used to pass messages to following units. Air vehicles may be provided to supplement organic means of communication during the march.

- (3) Each unit marching as part of a larger unit maintains liaison with the preceding unit. A liaison officer or agent travels with the preceding unit and keeps his commander informed of the preceding unit's location and gives him early warning of any unscheduled halt and the reason for it as soon as it is determined.

b. Traffic Control of the March.

- (1) Traffic controllers are posted at critical points along the route to keep all elements on the proper route and to minimize delays caused by other columns, civilian or refugee traffic, congested areas, or difficult terrain. Traffic controllers are posted in pairs, one to direct traffic while the other provides security. Their equipment should provide for identification during hours of darkness.
- (2) When a unit is marching as a part of a larger unit, traffic controllers are provided normally by the headquarters controlling the march (FM 19-25).

c. Control of Speeds in the Column.

- (1) Elements in a column of any length encounter simultaneously many different types of routes and obstacles, resulting in different parts of the column moving at different speeds at the same time. This produces an undesirable accordion-like action or whip.
- (2) To reduce whip the leading vehicle must not exceed the authorized maximum speed of the slowest vehicle in the column, especially after negotiating an obstacle. To minimize vehicle congestion on the near side of an obstacle, vehicle commanders and drivers must be alert and maintain the prescribed minimum distance between vehicles. To further reduce whip, and to maintain proper march distance, each vehicle when reducing or increasing speed to maintain the prescribed rate of march must do so gradually (FM 25-10).

d. Individual Vehicle Control on the March.

- (1) The march order should prescribe a maximum allowable speed applicable to all vehicles. This speed must be based on the maximum sustained speed of the slowest vehicle in the column. It will not be exceeded even when closing gaps or making up for lost time. Normally, march orders should specify that vehicles that have dropped out of the column for any reason regain their position in column only by passing units or vehicles that have halted.
- (2) Each vehicle commander is responsible for the conduct and movement of his vehicle. His responsibilities include—
 - (a) Insuring that the vehicle maintains proper intervehicular distance in the column.
 - (b) Designating crewmembers to control traffic and to assist passing traffic when his vehicle is halted.
 - (c) Supervising maintenance and service of the vehicle at halts.
 - (d) Repeating signals passed back along the column.
 - (e) Furnishing local security.
- (3) The following rules will assist drivers and vehicle commanders to insure proper procedure on a march.
 - (a) Start engine on signal from the unit commander, and keep alert for the command to move out.
 - (b) Move out slowly, and allow the vehicle ahead to gain its proper intervehicular distance as normal speed is reached.
 - (c) Keep in the lane of the column unless required to give way to or pass other traffic.
 - (d) Maintain an even driving pace, increasing and decreasing speed gradually. Do not speed to catch up; do not lag behind.
 - (e) Regain proper distance from the vehicle ahead by gradual changes in speed.
 - (f) Watch the vehicle ahead for changes in direction, traffic hazards, column signals, etc.

- (g) Keep position in the column unless ordered or signaled to pass other elements.
- (h) Shift into proper gear when approaching a hill.
- (i) Obey traffic signals, signs, and markers except when instructed otherwise (for example, when traffic controllers have cleared the way for the column to pass intersections).
- (j) If possible, move a disabled vehicle off the route to the right and signal the succeeding vehicle to pass.
- (k) Insure that your vehicle has cleared the route or is as far as possible to the right side of the route.
- (l) Stop the engine on proper signal or if the vehicle is to stand longer than a few minutes.
- (m) Wait for the command before dismounting at halts.
- (n) Keep to the offroute side of the vehicle, and off the traveled part of the route, when dismounted.

19. Halts

a. Units on the march normally make scheduled halts of 15 minutes duration after each 1 hour and 45 minutes of marching. At scheduled halts, all march units and serials halt *simultaneously* at the specified time; they make no attempt to close up gaps in the column. Vehicular crews perform their during-operation maintenance services at the scheduled halts.

b. At halts, march unit and serial commanders make sure that—

- (1) Traffic controllers are posted at the front and rear of each march unit.
- (2) Correct intervehicular distance is maintained.
- (3) All vehicles and personnel remain well on the right side of the route and keep the traveled part of the route clear.
- (4) Ground and air security is maintained.
- (5) Crew maintenance is performed by the crew of each vehicle.
- (6) Vehicle personnel are alert to receive and relay signals for the resumption of the march. This is particularly important at night when

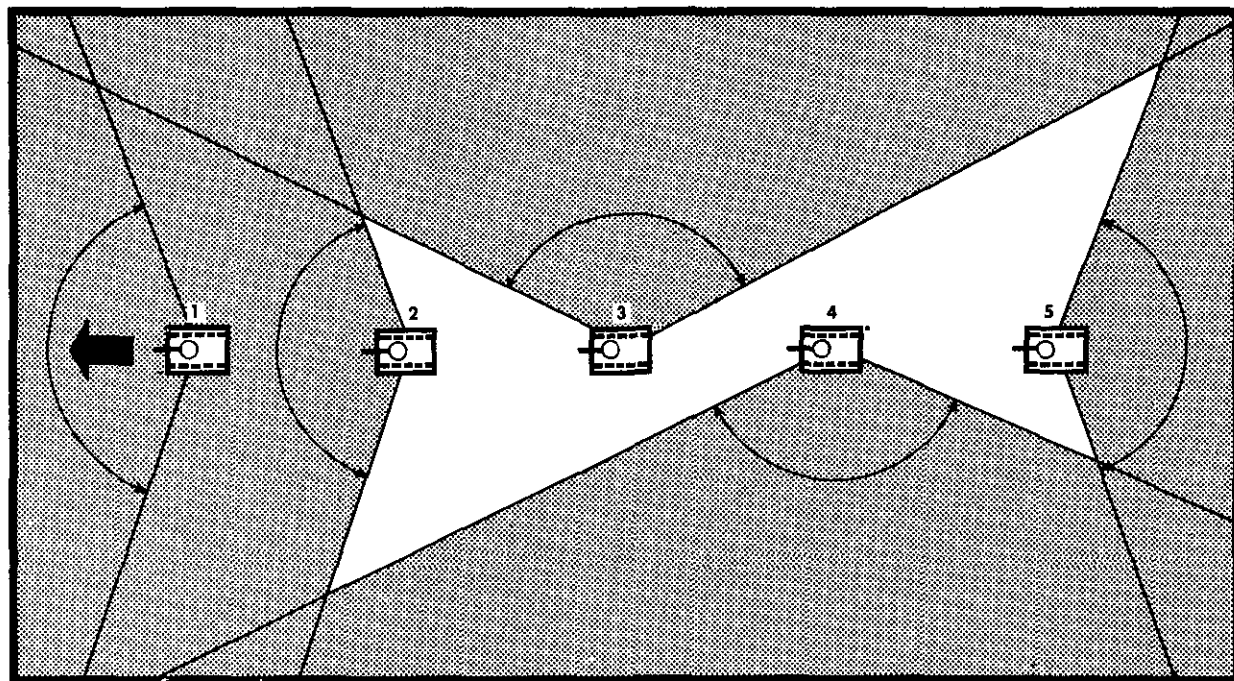


Figure 49. Vehicles assigned primary sectors of responsibility for observation.

personal contact should be maintained with the vehicle in front.

- (7) Maintenance personnel check the mechanical condition of vehicles as appropriate.
- (8) All vehicles move out at the same time after the halt.

c. Unit SOP's must prescribe the actions to be taken when unscheduled halts occur. As a minimum, vehicle commanders make contact with the vehicle to their front and commanders take appropriate action to determine and eliminate the cause of the halt.

d. Halts for refueling should be scheduled in *advance*; this enables march unit commanders to make definite plans for refueling.

e. It may be desirable to clear the route of march temporarily to shorten the column. When the terrain permits, units do this by coiling up on each side of the route. In an administrative march, the units are placed so they can easily move back onto the road. If tactical considerations govern, the units are placed to facilitate movement in the direction of the expected action.

20. Security

a. General.

- (1) *Secrecy*. Secrecy makes a major contribution to the security of a unit on a march. All measures are employed to keep the enemy from learning of the intention to march or detecting a march once it has begun.
- (2) *Security forces*. Security may be provided by a covering force, advance, flank, and rear guards, or by the relative position of other friendly forces. For details of security forces, see chapter 5.

b. Security Before the March.

- (1) *Secrecy*. Routine operations should be maintained up to the time of movement, with no apparent increase or decrease in activity. Movement of vehicles or units should be kept to a minimum and the number and size of reconnaissance parties may have to be restricted. Concealment offered by darkness is used for unavoidable major movements.

- (2) *Communication.* Radio transmissions continue at average rates before the move. Plans may be made to continue dummy radio traffic after the march is begun as a deceptive measure.

c. Security During the March.

- (1) *Secrecy.* Marches may be conducted at night or during periods of reduced visibility. Routes may be selected that offer maximum concealment. Marches should be accomplished in as short a time as possible.
- (2) *Air vehicles.* In addition to reconnoitering routes and supervising the execution of the march, air vehicles provide security by reporting like enemy air vehicles and high performance aircraft.
- (3) *Communication.* Listening silence may be prescribed during the march. If listening silence is not in effect, low power and minimum transmissions assist in preserving secrecy.
- (4) *Sectors of observation.* While on the march and at halts, each vehicle commander is assigned a primary sector of responsibility for observation (fig. 49). These sectors are assigned in a pattern to provide all-round observation.
- (5) *Security against air attack.* During the march and at the halt, the unit must provide its own security against air attack. This is done by designating an air sentry on each vehicle. Proper distances must be maintained between vehicles. See appendix XI for further discussion.
- (6) *Defense against nuclear attack.* Moving march formations normally present poor targets for enemy nuclear weapons. Increased emphasis is placed on avoiding congestion at obstacles.
- (7) *Local security.* At halts, each vehicle crew posts a sentry in the turret or at a nearby vantage point. Tanks may be posted to cover any suspicious areas or avenues of approach during long halts (fig. 50).

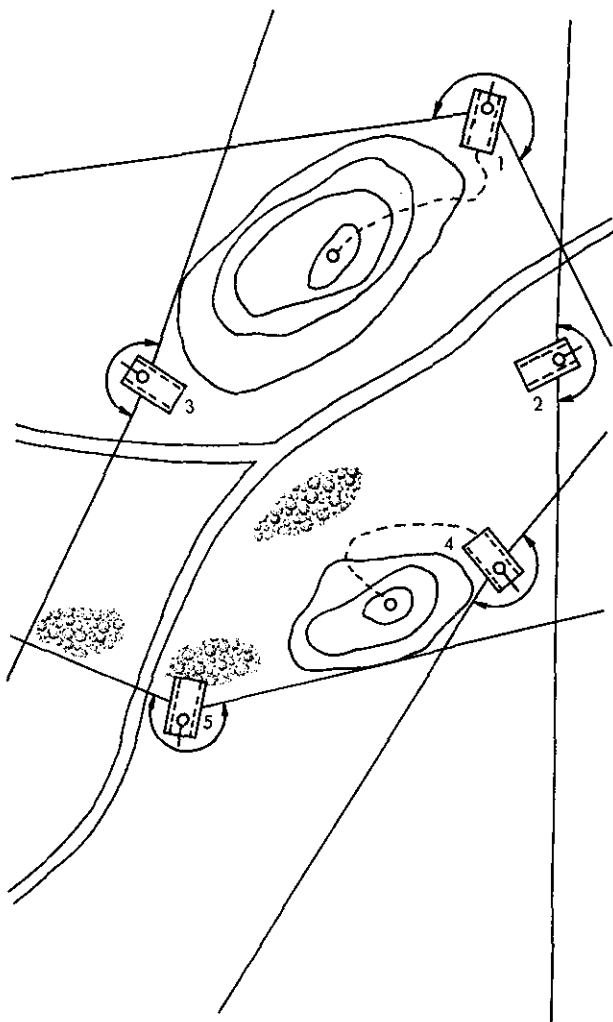


Figure 50. At halts, all avenues of approach are covered.

21. March Logistics

See paragraphs 132 through 136.

22. Movement Orders

a. The movement order is an operation order. As an operation order, it is prepared and issued in accordance with the principles discussed in appendix IX. Items appropriate for inclusion in the march order are—

- (1) Destination.
- (2) Route.
- (3) Rate of march (may be SOP).
- (4) Order of march.
- (5) Location of the start point.
- (6) Time of arrival at the start point.

- (7) Security (may be SOP).
 - (8) Scheduled halts (may be SOP).
 - (9) Intervehicular distance and time interval between march units (may be SOP).
 - (10) Communication.
 - (11) Location of the command post during the march (may be SOP).
 - (12) Traffic control measures (may be SOP).
 - (13) Critical points.
 - (14) Location of the release point.
 - (15) Time each march unit is to clear the release point and any other critical points along the route of march.
- b. Strip maps may be supplied to all key personnel, including vehicle commanders and guides. The strip map is a sketch of a route of march. The amount of detail, for example, distances or location of critical points, is dependent on the intended purpose and unit level of use of the strip map (fig. 51).

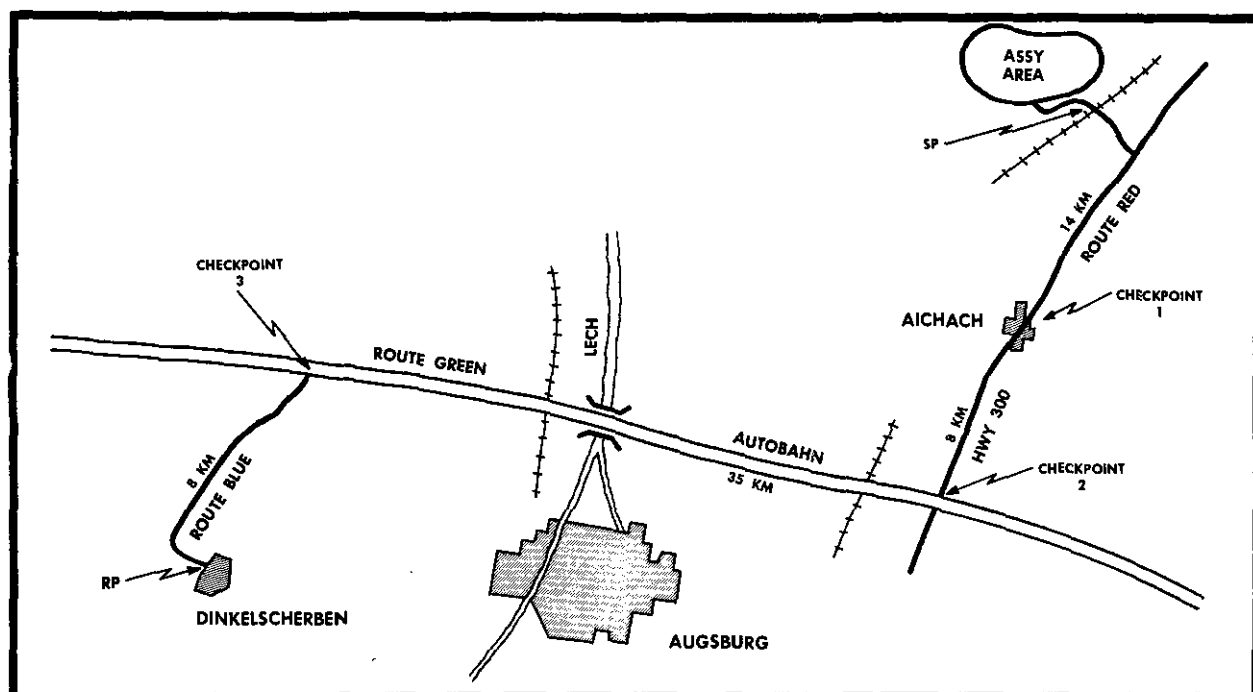


Figure 51. Strip map.

Section III. MOVEMENT BY RAIL

23. General

When rail facilities are limited, tracked vehicles may be moved by rail and other vehicles marched by road. Calculations and figures shown herein are based on American railway equipment, personnel, and procedure. Use of foreign railway equipment and personnel, and the location of the enemy will dictate changes in the details of these troop and equipment movement and loading plans.

24. Planning the Movement

a. *Responsibilities.* Troop and equipment movements by rail are the joint responsibility of the unit being moved and the transportation agency. The local transportation agency establishes the facilities necessary to accommodate the unit during movement. It furnishes administrative support, technical guidance and supervision, and security during movement except when the responsibility is charged to other

agencies. The moving unit is responsible for preparing and implementing plans in accordance with directives and in cooperation with the transportation agency. It provides housekeeping and local security details of troops to the transportation agency and is charged with its own internal administration and control.

b. Orders. The order directing the movement of a unit by rail will designate the point or points at which it will entrain, desired closing time, and destination. The sequence in which elements are moved is determined by the availability of transportation, the mission, and the situation that will confront the unit at its destination. The assignment of units to entraining points is determined by availability of suitable loading facilities, materiel to be loaded, and closeness of units to the entraining points.

25. Functions of Key Personnel

a. General. The details incident to the movement of a unit are handled by the unit logistics staff officer (S4) so far as transportation is concerned. He must work closely with the local transportation officer in planning, preparing for movement, and entraining. He collects and compiles all information necessary for the preparation of the movement, and gives it to the local transportation officer. The local transportation officer requires the following information:

- (1) *Number of persons to be moved.* This will be broken down by classes, that is, the number of officers, enlisted men, stretcher cases, medical attendants, dependents (if any), and evacuees; further, the number of males and females in each category must be indicated.
- (2) *Equipment desired (number and kind of cars).* Length of cars required to handle military impedimenta and organizational equipment, and specific information when special type cars are necessary must be furnished.
- (3) *Date desired.* This is a date for placement of cars, date to depart, or date due at destination—whichever is applicable.
- (4) *Authority for the move.*
- (5) *Amount of baggage, impedimenta, etc.*

(6) *Mixed train, if desired.* A mixed train is a combination of passenger and freight cars.

(7) *Destination.*

(8) *Entraining points desired.*

(9) *Reference to oversea requisition number.* If troops are going to a port of embarkation for shipment overseas, this number is needed.

b. General Functions of Unit Officers.

- (1) *Unit commander.* The unit commander is responsible for the entraining and detraining of personnel and equipment in accordance with the terms of the movement order.
- (2) *Unit staff.* The staff is responsible for planning, supervising and coordinating all movement activities in accordance with the directives of the unit commander.
- (3) *Train commanders.* The designated train commander supervises all matters pertaining to the safety of personnel and freight en route and supervises intermediate services required by personnel and freight from the time the train is accepted for movement by the railroad until the train is delivered at the destination.

26. Unit Movement Operations

The principal operations involved in the movement of a unit are divided into three phases—training, alert, and movement.

a. Training Phase. During this phase, which is the period before receipt of the warning order, a standing operating procedure is developed, key personnel are trained for the jobs they will perform during the movement, and equipment estimates are prepared.

b. Alert Phase. During this phase—the period between receipt of the warning order and receipt of the movement order—personnel, baggage, organizational equipment, vehicles, and other property are prepared for shipment. Training is intensified. All plans for the movement are completed during this phase.

c. Movement Phase. During this phase—the period time between receipt of the movement order and final detraining at destination—

troops entrain, impedimenta is loaded, and the movement is accomplished.

27. Principles of Rail Movements

a. Different types of equipment have different freight rates, and should be loaded separately, that is, baggage of personnel (having a higher freight rate) should not be loaded in vehicles, which are loaded on flat cars.

b. In loading equipment and supplies, the minimum freight weight of a railroad car should be met whenever possible.

c. The towed piece of equipment should be with the towing vehicle to facilitate loading and unloading.

d. A 12-inch brake wheel clearance per car (American) must be allowed for *all* freight.

28. Rail Movement Table

a. The rail movement table shows actual strength of the unit, type and amount of equipment, number and type of cars (for planning purposes), and other pertinent information. It is kept current, and following receipt of movement orders, it is used to prepare the train consist table. The rail movement table is prepared during the training phase of movement operations and, in accordance with Army regulations, must be maintained current. The unit S4 initially prepares the rail movement table. He revises it to conform with current strength, impedimenta, and equipment to be moved, and maintains an up-to-date table through all phases of the movement. *Final revision of the movement table is made upon receipt of orders directing the movement.*

b. To be ready for movement, each troop unit will prepare and maintain up-to-date rail movement tables, under guidance of the unit transportation officer (S4).

29. Loading Plans

a. *General.* Loading plans are essential to intelligent and accurate preparation of a rail movement table. A loading plan provides the type and amount of railway equipment required by a unit as well as that required by each subordinate organization (fig. 52).

b. *Space Requirements for Troop Loading.*

For planning purposes and staff training, the following assumptions may be made.

(1) *Sleeping cars.* Average (standard and tourist Pullmans). These cars will ordinarily accommodate 26 troops with individual equipment.

(a) Officers and warrant officers will normally be moved in standard Pullmans, two per section.

(b) Enlisted men move in either standard or tourist Pullmans, or coaches.

(2) *Coaches.* A coach can accommodate 55 troops with individual equipment.

(3) *Passenger trains.* Passenger trains consist normally of 11 sleeping cars, 2 kitchen-baggage cars, and 1 or 2 baggage cars. A train of this size will normally accommodate two companies.

(4) *Freight trains.* For troop unit moves, including heavy equipment such as tanks, artillery, and engineer equipment, each train does not normally exceed 65 cars for infantry divisions and 55 cars for armored divisions.

(5) *Mixed trains.* Mixed trains, which carry personnel with their vehicles, artillery and equipment, are desirable from a tactical and organizational standpoint.

c. *Loading Organizational Equipment.*

(1) The amount of headquarters, kitchen, and maintenance equipment varies in units. For planning purposes, 20 short tons (2,000 pounds per ton) are allowed per company or equivalent unit.

(2) Organizational equipment moves normally in baggage or box cars.

d. *Flat Cars.* Flat car requirements are computed on the basis of maximum use of each car, regardless of length. *Do not restrict computation to cars of one length.* Twelve inches at 1 end of each car must be left for brake-wheel clearance. Length, width, height, and weight must be considered in loading vehicles and equipment. Final approval of loads will be made by the local transportation officer.

30. Train Consist Table

a. *General.* The train consist table is prepared after the rail movement table has been

SUMMARY OF FREIGHT CARS

Figure 52. Vehicle and equipment loading plan.

revised following receipt of the movement order. The unit transportation officer (S4), as directed by the unit commander, prepares the train consist table from data appearing on the completed rail movement table. The commanding officer of a unit must designate the order in which the various organizations of his unit are to move to insure their arrival at the destination in the sequence he desires.

b. Making Up Trains and Train Sections.

(1) *Size.* Trains of moderate size that are capable of making good speed are preferable to long trains of slow speed.

(2) *Makeup.* The carrier is responsible for making up the trains and will be governed by the operating rules of the railroad. When the size of the train is fixed, the makeup (relative positions of cars) of the train will be determined by the railroad representatives, who comply with the wishes of the military authorities as far as practicable.

(a) *Personnel.* With few exceptions, organizations will not be broken up by assignment to more than one train when it can be avoided. Whenever organizations must be broken up, the commanding officers of such organizations should be notified as soon as possible so adequate arrangements may be made for feeding and caring for the troops in each train.

(b) *Baggage.* Troops and their baggage normally will not move on different trains. When there are two or more trains, the proper baggage cars should accompany each train.

(c) *Freight.*

1. In movements of large bodies of troops, freight normally moves by separate trains.

2. When there is not enough freight to make up a train, the cars containing the freight belonging to the troops assigned to each train will be attached to that train.

c. Preparation of the Train Consist Table (fig. 53).

(1) *Train number.* When a movement to 1 destination consists of more than 1

train, the trains are designated by Army numbers. These numbers will be put in the train number column of the table in the order in which they will depart; for example: train 1, train 2, etc.

(2) *Transportation groupings.* In this column will be shown the units or organizations moving on each train.

(3) *Railway equipment.* The number of cars to be carried in each train, under the proper designations, will be shown in this column. Under the total column will be shown the sum of these cars for each train.

(4) *Train officers.* In this column are shown the key officers assigned to each train. They are responsible for the conduct and welfare of the troops.

31. The Individual Train Loading Plan

a. This plan is prepared by the unit transportation officer (S4) after the rail movement table has been revised and the train consist table has been prepared.

(1) In each block the specific personnel, by number and equipment, to be assigned to each car is indicated.

(2) In each block representing an open-top freight car (flat or gondola), the equipment specifically assigned to each car is indicated.

(3) In the space provided at the bottom of the plan, all cars (freight and passenger) should be assigned by block numbers (not by rail car initials and numbers) to the specific units that will occupy them.

b. When the individual train loading plan has been completed, copies will be furnished to—

(1) Unit commanders.

(2) Entraining officers.

(3) Train commanders.

(4) Motor park dispatcher (so that vehicles will arrive at the entraining point in the order in which they will be loaded on railway cars).

(5) Local transportation officer.

32. The Entraining Table

a. *General.* The entraining table is prepared by the unit transportation officer (S4) after the

Figure 53. Train consist table.

- (1) Each organization must be at the entraining point.
- (2) Each train will depart from the entraining point.
- (3) Each train will arrive at its destination; this, of necessity, will be an expected time of arrival.

- (1) Train number will be as indicated on the train consist form.
- (2) The local transportation officer will obtain the MAIN and MI number, which authorized the movement of each train.
- (3) The entraining officers are designated by name on the entraining table. They

[illegible]

(A) Hayshed ramp, Fort Knox, Kentucky.
(B) New siding ramp, Fort Knox, Kentucky.
(C) North ramp, Fort Knox, Kentucky.

241

are detailed by the commanding officer of the troops. The entraining officer—

- (a) Supervises the loading of both personnel and property that will move in the train.
- (b) Precedes the command to the entraining point and acts as guide for the unit.

33. Trains En Route

a. Problems and details involving troops, military freight, and the carrier railroad en route are solved, if possible, by the train commander and the railroad representative. If solution on the spot is not possible, the problem will be referred to a designated authority.

b. The responsibility of troop train commanders starts at the home station and terminates upon arrival at the destination. The train commander does not control railroad personnel, operation of the train, or train schedule.

34. Detraining

a. Detraining must be planned carefully. The requirements parallel those of entraining.

b. It is desirable to send advance parties, when possible, to prepare the following:

- (1) Arrangements for the arrival of the trains.
- (2) Unloading facilities.
- (3) Traffic control.
- (4) Assembly areas for personnel and equipment.
- (5) Routes of departure from detraining area.
- (6) Barracks or bivouac areas.
- (7) Transportation and equipment necessary to effect detraining of troops, unloading of equipment, and movement of troops and equipment to assigned areas.

Section IV. MOVEMENTS BY AIR

35. General

Movements by air involve the transportation of troops, units, supplies, or equipment into an objective area, or into an area inaccessible to other means of transport. Air movements may be either tactical or administrative, or a combination of tactical and administrative. The air movement may be for the execution of a tactical or strategic mission. Movement by air exploits the capability of air vehicles to overcome distance and geographical barriers and is characterized by flexibility and speed. Transport air vehicles are limited in their cargo carrying capability by size and weight restrictions. Adverse weather, inadequate landing facilities, and enemy counterair activities may restrict further the suitability of air vehicles as a means of transportation for armor units.

36. Responsibilities

a. The Military Air Transport Services (MATS) or the U.S. Air Force has been designated the agency for intertheatre movements by air. Air movements using Army aviation are limited normally to a theater of operation.

b. For considerations governing the employment of air transportation, see FM 57-10, FM 57-35, FM 61-100, and FM 100-5. Staff procedures and details regarding planning, use, and stowage of air transport are contained in FM 57-10, FM 57-35, FM 57-100, and FM 101-10, and TM 57-210. The responsibilities of the unit being moved are the same as set forth in paragraph 24, this appendix.

Section V. MOVEMENTS BY WATER

37. General

a. Water transport is the primary means used to establish and maintain overseas operations. It is characterized by large capacity for personnel and equipment, long range operations, relatively slow speed compared to air movements, and a high rate of movement.

b. Movements by water are especially vulnerable to attack by nuclear weapons and by enemy surface, subsurface, and air forces. When there is danger of attack by hostile forces, vessels will be assembled usually in convoy under command of the Navy and provided with naval escort. Air cover by land or carrier

based aircraft will normally be provided convoys determined critical to the overseas operation. Convoys of lesser importance will be provided air cover consistent with existing capabilities and priorities.

38. Responsibilities

a. The Military Sea Transport Services (MSTS) or the U.S. Navy has been designated

the agency for oversea movements by water. The responsibilities of the moving agency are set forth in JCS Pub 2.

b. The responsibilities of the unit being moved are the same as set forth in paragraph 24, this appendix. For details regarding planning, use, and stowage of water transport, see FM 31-12, FM 31-13, FM 61-100, FM 100-5, and FM 101-10.

APPENDIX VII

ESTIMATE OF THE SITUATION

1. General

The purpose of the estimate is to arrive at a decision through a logical and orderly examination of all factors affecting the accomplishment of the mission. It involves reason and judgment and should not be a mechanical process (example below). Estimates made are usually mental and may not be written.

Example. Sequence of the leader's estimate of the situation.

1. MISSION

2. THE SITUATION AND COURSES OF ACTION

a. Considerations affecting the possible courses of action.

(1) Characteristics of the area of operations.

(2) Enemy situation.

(3) Own situation.

(4) Relative combat power.

b. Enemy capabilities.

c. Own courses of action.

3. ANALYSIS OF OPPOSING COURSES OF ACTION

(Analysis of effect of each enemy capability on each of own courses of action.)

4. COMPARISON OF OWN COURSES OF ACTION

(Summary of advantages and disadvantages of own course of action.)

5. DECISION

(Who, what, when, where, how, and why.)

2. Explanation

a. *Mission* (step 1). The mission is a clear, concise, and simple statement of the task to be accomplished and its purpose. The analysis of the mission is the beginning of the estimate.

Note. The italicized parts in the following paragraphs are a platoon leader's mental estimate of the situation (fig. 55).

1st Platoon, Team A, attacks at 1430 hours to seize Hill A and continues the attack to the north on order.

b. *The Situation and Courses of Action* (step 2). The purpose of this part of the estimate is to think through all significant facts pertaining to the situation to examine what influence they will have on the employment of the unit. Considering the factors of METT (mission, enemy, terrain and weather, troops available) various ways to accomplish the mission are determined. These are conceived in general terms and involve the employment of the unit as a whole. All possible ways are considered; those that are feasible and vary significantly are retained for further examination. They are called courses of action. In arriving at a decision the commander must answer the questions; *who, what, when, where, how* and, if required, *why?*. The *who, what, when, and where*, are normally prescribed in the mission. *1st Platoon, Team A (who) will attack (what) at 1430 hours (when) to seize Hill A (where) and continue the attack to the north on order.* This leaves the *how* to be solved. The elements of *how* are the possible formations of the unit; the firepower that may be employed; and the direction the attack will move. The result of this examination will be the development of feasible courses of action.

(1) *Terrain.* All aspects of the terrain in the area of operations are studied to gain familiarity with observation and fields of fire, cover, and concealment, obstacles, key terrain, and avenues of approach.

Hills A, B, and C are key terrain features because control of these features will offer me or the enemy a marked advantage in that the hills offer good observation and fields of fire. From these hills I can control the surrounding terrain to the limit of my tank gun range. The wooded low

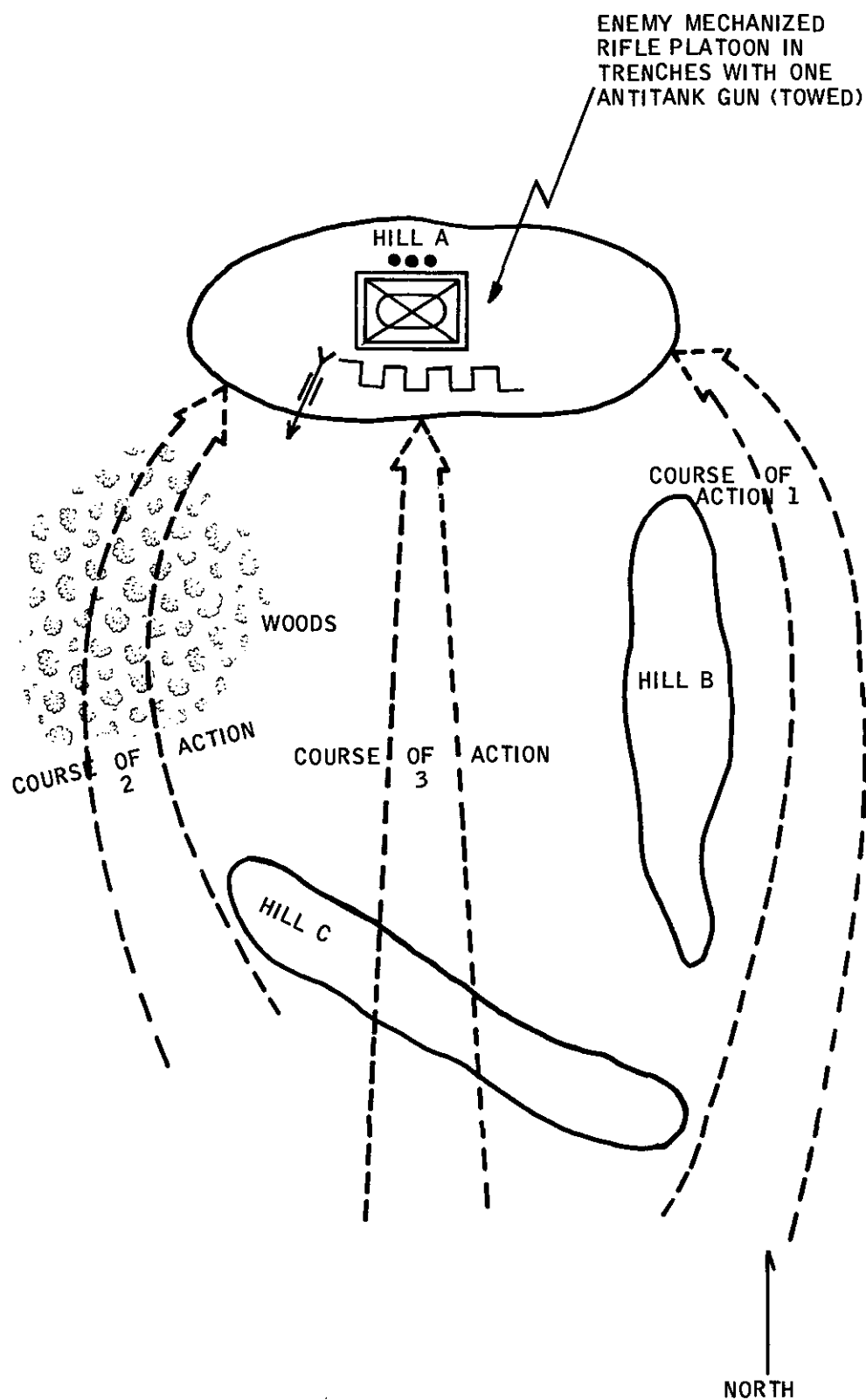


Figure 55. Situation and courses of action.

ground will restrict by observation and fields of fire and hinder my movement and may require the supporting infantry to dismount and clear the woods but it offers good concealment and forces the enemy to shift his fires to his flank. Hill B will offer me a covered approach and forces the enemy to shift his fires to the flank. I can attack on a straight line from Hill C to Hill A, which is the fastest approach and has unlimited fields of fire and observation; however, I would be under direct fire from the enemy all the way to Hill A, and my flanks are exposed to woods on the left and high ground on the right.

- (2) *Weather.* Past, existing, and predicted weather conditions must be considered.

There are 6 hours of daylight left. No rain has fallen for the past week. No rain is expected.

- (3) *Relative combat power.* All factors of troops available are judged and weighed to determine their effect on the combat power of the unit, such as strength, composition, disposition, reinforcements, logistics, training, and morale. Since combat power is relative, the same considerations are applied to the enemy situation to determine enemy capabilities.

Enemy situation. Enemy action and reports, indicate that he has organized a platoon-size blocking position on Hill A. He has a towed antitank gun on the west of his position. Own situation. My platoon is up to strength, and supply and equipment are adequate for this mission. The mobile firepower of my tank platoon, and the capabilities of the supporting infantry and other combat support, provides the platoon with a combat power advantage (firepower, equipment, and mobility) over the enemy.

- (4) *Enemy capabilities.* The significant enemy capabilities are actions of which the enemy is capable physically and which, if adopted, will affect the

accomplishment of the friendly unit's mission.

Defend in place.

Withdraw north of Hill A.

Attack.

Enemy intentions are not considered, as this leads to "guessing."

- (5) *Own courses of action.* Courses of action, to be useful and manageable, should vary significantly. One of the courses of action will become the decision; therefore, the courses of action must be complete and as accurate as possible. Those considered are—
- (a) *Course of action 1 is the use of the right (east) approach with my platoon in line formation.*
 - (b) *Course of action 2 is the use of wooded left (west) approach with my platoon in line formation.*
 - (c) *Course of action 3 is the use of the center approach with my platoon in wedge formation.*

c. *Analysis of Opposing Courses of Action (step 3).*

- (1) Each of the enemy capabilities is studied (considered in step 2) to determine its broad impact on each course of action. Enemy capabilities that have little or no influence on the courses of action are not considered further. *Each* course of action is then analyzed against *all* of the remaining enemy capabilities. The technique used in the analysis is to picture the action by both sides in logical sequence throughout the operations. This mental study (war game) includes consideration of the factors of METT and their effect on the action to determine the probable outcome of the course of action under consideration. This analysis serves to refine the *where* and *how* and to identify some of the advantages and disadvantages of each course of action. The enemy's ability to oppose the course of action and the effectiveness of this opposition are determined from this mental war gaming.
- (2) This process is repeated for each of the other courses of action.

- (3) During the analysis, the estimator may make major changes in courses of action; eliminate one or more from further consideration; or form a new one.
- (4) No attempt should be made to compare own courses of action during this war gaming. It is neither possible nor practicable to reach a conclusion at this point since only one basis of comparison, the enemy, has been used.

The enemy can defend in place on Hill A with long range antitank fires. The defense can be overcome with my superior firepower and mobility. The enemy can withdraw to the north, which will affect my chosen courses of action equally, so I will not consider this capability any further. If the enemy attacks, a new situation is presented which requires a new estimate, so I will not consider this capability any further. Course of action 1 versus enemy capability to defend avoids his best defenses (to his front) and requires him to move his antitank gun and other fires to his left flank. Course of action 2 versus enemy capability to defend moves in an approach concealed from his observation, but the woods will slow down my movement, and his antitank gun is on this flank. Course of action 3 versus enemy capability to defend puts my platoon in the open directly in front of the enemy's best defenses; however, it will place me on the objective in the shortest time.

d. Comparison of Own Courses of Action (step 4).

- (1) The first problem in making the comparison is the selection of the governing factors under which the courses of action will be compared. The governing factors are isolated from the study and deductions of METT in the analysis of the situation and from the comparisons with enemy capabilities. To be useful, a governing factor must not affect all courses of action equally.
- (2) Since each course of action will either use different terrain or use the same terrain in different ways, *terrain* is normally a governing factor.
- (3) *Enemy and friendly dispositions* usually affect courses of action differently and are usually governing factors.
- (4) *Enemy capabilities* may be governing factors.
- (5) *Time* may be a governing factor.
- (6) *The governing factors in this situation are terrain and enemy dispositions. My dispositions and enemy capabilities effect all courses equally and, therefore, do not become a basis for comparison, and sufficient time is available to employ any of the three courses of action.*

The comparison of own courses of action in the light of the appropriate governing factors reveals the advantages and disadvantages of each course of action. The mental weighing of the advantages and disadvantages and the determination if any, of the governing factors exert a decisive influence, demands sound professional judgment, military experience, and an analytical mind. No formula, arbitrary system of weighing factors, or rules of thumb can substitute for these qualities.

The terrain in course of action 1 gives me an approach with cover but is the longest route. In course of action 2 the woods hinder my movement, but conceal my platoon. Course of action 3 is the shortest route but it is open to observation and fields of fire. Terrain favors course of action 1. Enemy dispositions in course of action 1 are hit from the flank, avoiding his best defense. In course of action 2 he is hit from the flank, but his main antitank weapon is on that flank. In course of action 3, I strike the enemy at his greatest strength. Enemy disposition favor course of action 1. My conclusion is that in this situation I can strike the enemy at his weakest

point and have a greater chance of success by using course of action 1.

- (7) If several courses of action offer equal prospects for success, the course of action that favors future action is selected.

e. Decision (step 5).

- (1) The decision is the course of action offering the best chance of success. The leader is responsible for his decision. It is translated into a concise statement of what the unit will do. It answers the following questions:

- (a) WHO: the unit to take some action, the command as a whole.
- (b) WHAT: the type action to be taken—attack, occupy, delay on successive positions, etc.
- (c) WHEN: time the operation is to start or end.

- (d) WHERE: area from which (defensive sector or delay lines), through which (avenue of approach), or to which (objective) the action will be accomplished.

- (e) HOW: a statement of the formation and organization for combat for the offense and the disposition of forces and their organization for combat in the defense and retrograde as well as the use of available fire support.

- (f) WHY: statement of the purpose; includes those details necessary to insure intelligent preparation and execution of the plan.

- (2) *My decision is for the platoon to attack in a line formation at 1430 hours along Hill B to seize Hill A.*

APPENDIX VIII

COMMANDER'S APPLICATION OF PRINCIPLES OF WAR

1. General

The commander, in analyzing courses of action during his estimate of the situation, should evaluate the relative merits of each selected course of action in light of the principles of war. Violation of principles should be avoided, if possible. If a principle is violated, the commander must be aware of the implications and be willing to accept the resultant risks. To illustrate application and use of the principles of war, the following situation and courses of action are discussed. No attempt has been made to discuss the enemy capabilities as they affect each course of action.

a. Situation.

- (1) Task Force 1 (1st Tank Battalion), 11th Armor, has been temporarily halted in the vicinity of Hill A prior to continuing the offensive. At 162000 Jun _____ the battalion task force commander received the following message, "Attack 171400 to seize Hill D: be prepared to continue the attack on order."
- (2) The enemy has been conducting a series of delaying actions. The enemy situation as to troop disposition and location is indicated on sketch map at figures 56, 57, and 58.
- (3) Battalion Task Force 1st Tk Bn, 11th Armor, has 3 tank companies and 1 mechanized infantry company.
- (4) Light data:

	BMNT	EENT
16 Jun _____	0440	2045
17 Jun _____	0430	2048
18 Jun _____	0425	2051

b. Courses of Action (CA).

- (1) *Course of action 1.* Attack to seize Hill D with 2 teams abreast, 1 tank-heavy on the north axis, 1 tank-heavy on the south axis, with remainder of the task force following and support-

ing on south axis. The armored cavalry platoon secures the northern flank of the south axis from Hill B initially (fig. 56).

- (2) *Course of action 2.* Attack in column, seize Hill C; on order, seize Hill D. Leading task force tank-heavy attacks down Federal Road 7, seizes Hill C. After Hill C has been secured, continue attack on order on two axes to seize Hill D. Armored cavalry platoon initially secures the south flank of Hill C from Hill B (fig. 57).
- (3) *Course of action 3.* Task force attacks, to seize Hill D, on south axis with two tank-heavy teams abreast. Remaining teams follow and support. Armored cavalry platoon protects northern flank initially from Hill B (fig. 58).
- (4) *Other courses of action.* There are other feasible courses of action in this situation. However, for explanation purposes only, the three courses of action selected above will be analyzed and discussed.

c. Principles of the Objective. The accomplishment of the mission is paramount; all other considerations must contribute to this end. The objective assigned to the commander in this situation facilitates the accomplishment of the brigade and division mission. The task force commander must in turn consider missions and means that he will allocate to his subordinates to accomplish his mission.

- (1) In CA 1 the commander plans to seize the objective assigned to him, thereby accomplishing his mission and contributing to the overall mission of the brigade.
- (2) CA 2 fails to provide for the timely seizure of the objective. Seizure of Hill C subjects his force to unnecessary contact with the enemy and could

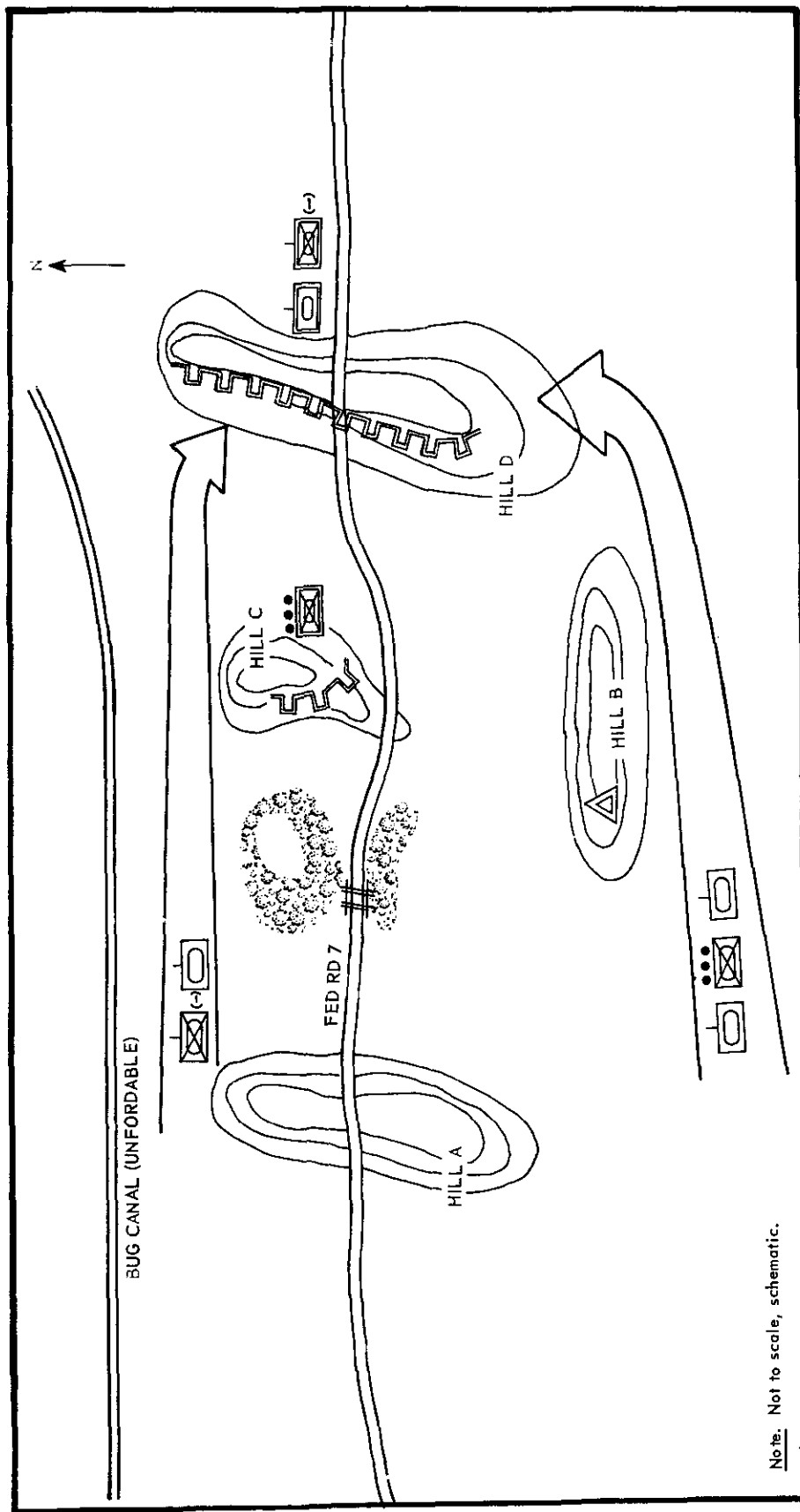


Figure 56. Course of action 1.

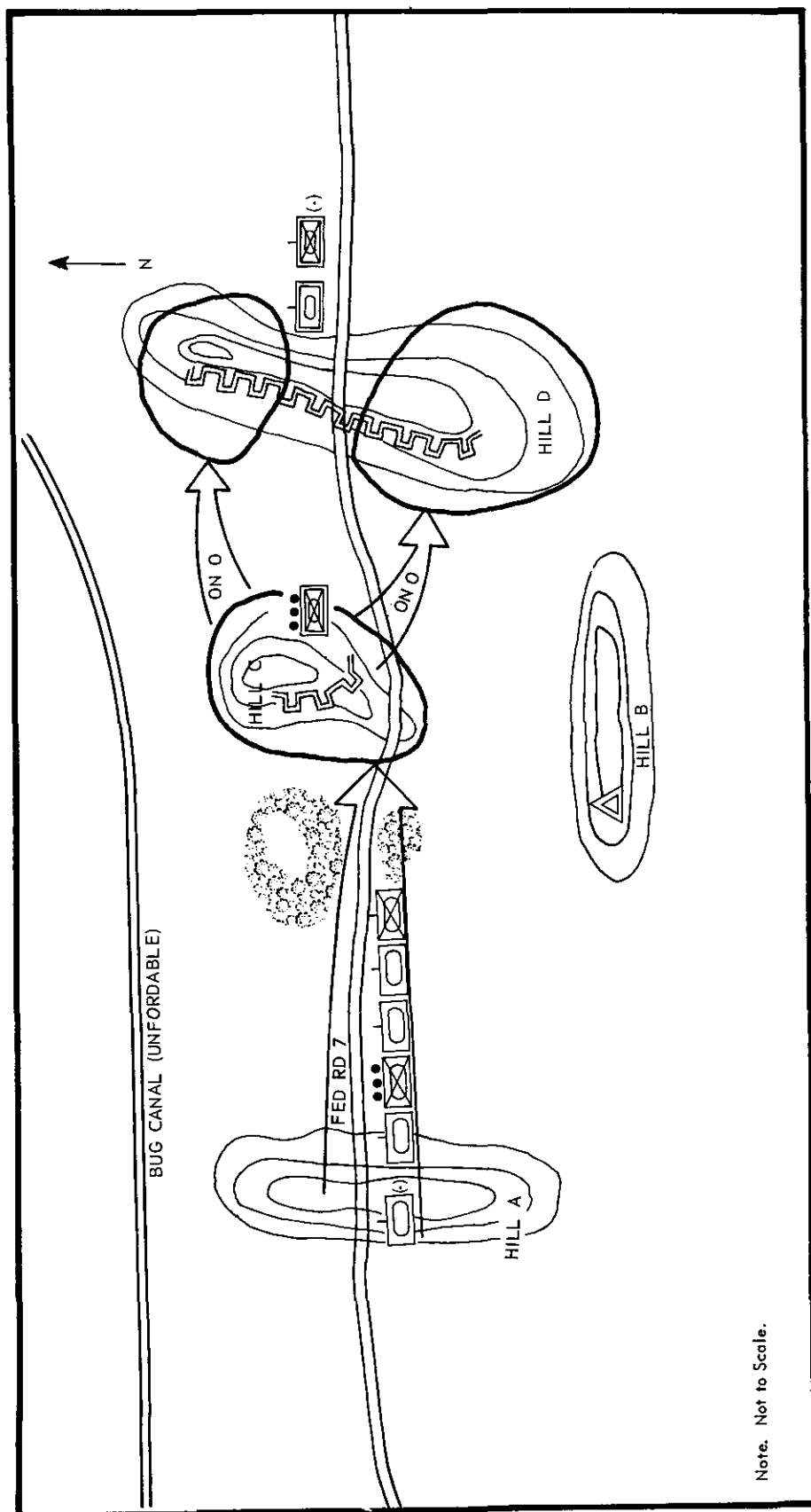


Figure 57. Course of action 2.

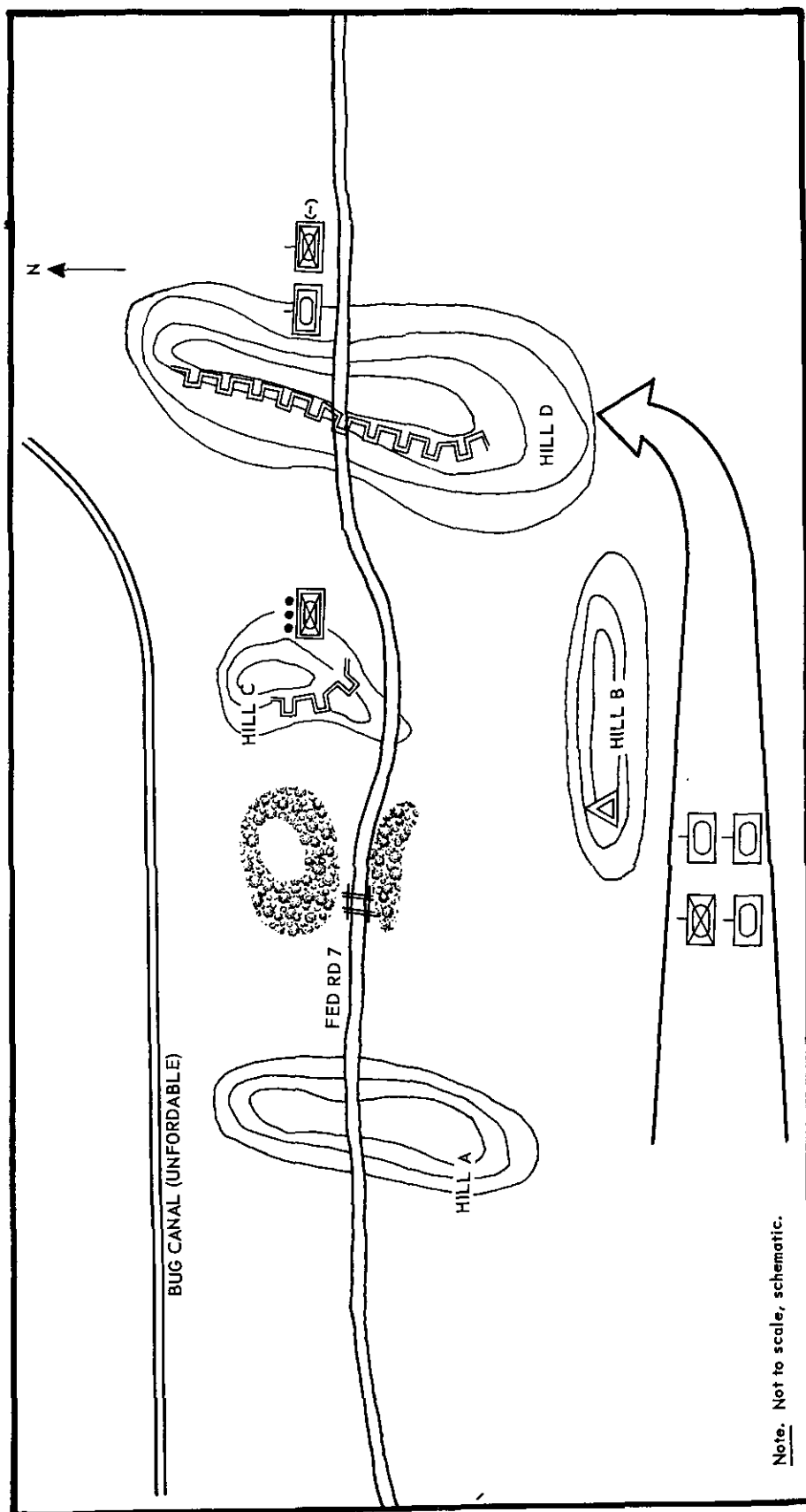


Figure 58. Course of action 3.

ultimately preclude seizure of Hill B. Failure to accomplish a timely seizure of the objective in this situation fails to contribute to the overall mission of the force and is a violation of the principle of the objective.

- (3) In CA 3 the objective is seized and the mission accomplished as in CA 1.
- (4) CA 1 or CA 3 is favored based on this principle.

d. Principle of the Offensive. The correct application of this principle requires that the commander impose his will upon the enemy to set the pace and course of battle; maintaining an aggressive attitude and the initiative, exploiting enemy weaknesses, and meeting unforeseen contingencies are an integral part of applying this principle.

- (1) In CA 1, the commander reasons that he can exploit and take advantage of the enemy's dispositions. By attacking on two axes of advance, he causes the enemy on Hill C to react against either the north or south axis of both simultaneously, thus creating favorable conditions for defeat or containment of the enemy. Under these conditions the commander can succeed in imposing his will upon the enemy.
- (2) In CA 2, the commander fails to maintain the offensive by stopping unnecessarily on Hill C and in so doing also fails to—
 - (a) Maintain the momentum of the attack.
 - (b) Retain the initiative.
 - (c) Maintain an aggressive attitude (in terms of (a) and (b) above).
- (3) In CA 3, the commander outflanks the enemy by an attack on Hill D from the South, and exploits an open flank while attacking in mass. The commander envisions that he will outflank the enemy positions on Hill C and cause the enemy to abandon this position. The enemy is now obliged to fight according to the commander's plan; thus he succeeds in imposing his will upon the enemy in this situation. The depth of the formation provides for maintenance of the momentum of

the attack, and will provide for unforeseen contingencies.

- (4) Based on this principle, CA 3 is favored.

e. Surprise. Striking the enemy when, where, or in a manner that he does not anticipate, will help the commander to attain surprise. The commander must consider under this principle, time of attack, direction, combat power to be employed, deception measures, secrecy, and rapid movement. Night attacks, although more difficult to execute, should be employed frequently and considered as normal operations. Continuation of the attack during darkness is also effective and serves to gain surprise. Attacking at generally the same time each day, that is, BMNT or BMNT—30, should be avoided. Deception measures are employed to mislead the enemy as to the true status or purpose of friendly activities. The deception measures are a part of the commander's counterintelligence measures, which include denial measures. Communication security is an important denial measure. Camouflage is used as a denial and deception measure. Rapid movement is associated not only with surprise, but it affords some security. Factors that contribute to the possible attainment of surprise in each course of action are—

- (1) CA 1.
 - (a) *The time of attack.* The unusual hour at which the attack commences could certainly cause surprise.
 - (b) *The direction of attack.* The enemy must decide whether to divide his forces and engage friendly forces on both axes or engage either one, and which one.
 - (c) *The resultant application of all combat power from both directions of attack.* Once the enemy on Hill C discovers the strength of the attack and the directions of attack, he is forced to decide whether to remain and be cut off, or withdraw to Hill D.
 - (d) *The speed of the attack.* The southern avenue of approach offers a fast unopposed route to Hill D; however, enemy interference could slow the forces on the northern axis.

(2) CA 2.

- (a) *Time of attack.* The same reasoning applies here as in CA 1.
- (b) *Directions of attack.* Not selecting the most obvious concealed routes of approach could possibly gain surprise from a deceptive viewpoint.

(3) CA 3.

- (a) *Time of attack.* This is the same as in CA 1 and CA 2.
 - (b) *The direction of attack.* Although the initial movement of the main force may be detected by the hostile OP or Hill B before the SP can be seized by the tank platoon, the subsequent direction of attack and assault by the main force remains unknown to the enemy to the extent that an effective redistribution of his forces will be possible.
 - (c) *The strength of the attack.* The overwhelming application of combat power on the flank of the enemy position on Hill D creates mass at the decisive time and place to insure success.
 - (d) *Speed of attack.* The anticipated speed on the unopposed southern route will insure rapid closing on the objective and may prevent the reaction of the enemy on Hill C to reinforce Hill D and the redistribution of enemy forces on Hill D.
- (4) *Selection.* CA 3 is favored by application of this principle. CA 1 facilitates surprise but not to the degree as does CA 3.

f. Security. Security encompasses all measures taken by a command to protect itself from the enemy. The commander achieves this by early cognizance of the enemy, by the formation used in the operation, and by the allocation of forces for front, flank, and rear protection, and through rapid movement.

- (1) In course of action 1, the commander's northern flank rests upon an unfordable canal and is relatively secure. However, he must concern himself with the security of the southern flank of the northern axis, which is relatively insecure, and the area between the

northern and southern axes. The possible lack of mutual support between the forces on two axes contributes to a lack of security. The depth of his formation on the southern flank provides flexibility with which to meet unforeseen contingencies and provide security. The disposition of the armored cavalry platoon on Hill B affords security to both flanks of the southern axis through observation, and can be used as a delaying position in the event of an attack from the south. To a limited extent it provides security to the southern flank of the northern axis.

- (2) In CA 2, the commander must plan for the protection of both flanks; although the northern flank is more secure than the southern flank because of the unfordable canal on the north. The column formation will provide for sufficient reaction time in the event of unforeseen developments from the south. In addition, the positioning of the armored cavalry platoon on Hill B will provide security, through observation, on the south flank, and as a delaying force in the event of an attack from the south.
- (3) In CA 3, the commander can protect his north flank by disposition of the armored cavalry platoon on Hill B. This terrain feature will provide observation to the north and south and can be used as a delay position in the event the enemy on Hill C attacks the formation. The depth of the formation will provide the flexibility to cope with unforeseen contingencies on the south flank.
- (4) Although all three courses of action provide for security, priority based on this principle is CA 2, CA 3, and CA 1.

g. Mass. The application of mass at the decisive time and place can achieve a superiority of combat power that will insure success. Even under conditions of a disparity of opposing forces, a local superiority of combat power can be attained against a numerically superior enemy, by the proper and decisive application of mass against detected enemy weaknesses.

The commander achieves mass by avoiding the dissipation of his combat power through piecemeal commitment, by employing all of his combat power against the enemy, with the bulk of it forward; by maneuvering, which is the application of his forces simultaneously from more than one direction; and by maintaining depth to the formation to influence the action.

- (1) CA 1 may achieve mass through the application of simultaneous combat power from multiple directions. However, the force attacking on the northern axis of advance could become engaged by enemy elements on Hill C.
- (2) In CA 2 mass cannot be applied initially by attacking in column. Although great depth in the attack is achieved initially and there is maximum provision for contingent action, particularly to the flanks, the formation provides only for the piecemeal commitment of forces forward against Hill C, thus forfeiting the application of mass. In the continuation of the attack from Hill C, mass is achieved through application of all combat power from multiple directions.
- (3) CA 3 meets all of the criteria for mass except for the application of combat power from multiple directions initially. Even this criteria can be met partly by changing the direction of attack of one team just before the assault.
- (4) CA 3 is favored based on this principle. CA 1 is a strong second choice.

h. Economy of Force. The application of mass may necessitate an exercise of economy of combat power in other areas, in the interest of gaining a superior combat power advantage over the enemy at the critical time and place. Nevertheless, the economy of force unit must be sufficiently strong to accomplish its mission. Skillful and prudent use of combat power to accomplish the mission with the minimum expenditure of resources is also within the meaning of economy of force. This means that a battalion is not employed to attack an enemy platoon. Only the combat power necessary is employed to do the job. The application of this principle in this situation is not readily ap-

parent since the commander in all courses of action applies all of his combat power in the furtherance of the mission. A marginal application of this principle, however, is in the use of the armored cavalry platoon in its security role. The commander has not allocated additional combat power for security, and accepts the security, and any resultant risks that accrue, that can be provided by the armored cavalry platoon. This is especially noticeable in CA 1 where security of the southern flank of the northern axis of advance is marginal.

i. Maneuver. Maneuver means the movement to place combat power of troops (units) and at a more advantageous position with regard to the enemy. It means that all military resources—combat power, combat support, and combat service support—be positioned and maneuverable to accomplish the mission. It requires relatively rapid movement and also, that the commander remain alert to anticipate probable future actions and plan for contingencies.

- (1) CA 1 envisages the maneuver of 2 teams of the task force to apply combat power at the proper time and place from more than 1 direction. The open avenues of approach afford rapid movement.
- (2) In CA 2 the commander does not take advantage of the terrain or his combat power to achieve maneuver. The mere movement of the task force in column toward Hill C does not constitute maneuver. If the commander would plan to assault Hill C from more than one direction or from the rear of flank, rather than the column formation, he would succeed in maneuvering his combat power. The continuation of the attack from Hill C on converging axes applies the principle of maneuver.
- (3) The rapidity of movement afforded by the covered avenue of approach to the south of Hill B and the attack of Hill D from the exposed flank applies properly the principle of maneuver.
- (4) Application of this principle favors CA 1 or CA 3.

j. Unity of Command. Unity of command must provide for single command authority.

Attachments to subordinate units establish a single command authority at that level. The commander at each level must have command or control of all resources required to accomplish the mission. Unity of command insures the following: Coordination of maneuver; adequate maneuver space and control measures; prevention of mutual interference by attacking teams converging on the objective from different directions; and unity of effort.

- (1) CA 1, CA 2, and CA 3 achieve unity of command through singleness of command at each level and centralized coordination of the final assault.
- (2) Unity of effort results from unity of command. Unity of effort can fail if subordinates do not carry out the commander's orders in the manner prescribed or in the spirit and with the intent desired by the commander.

k. Simplicity. Simplicity embodies simple plans and execution. A simple plan with only such detail to insure understanding by subordinates generally precludes a cumbersome, uncoordinated, complex, and time-consuming execution.

- (1) CA 1 is more complex in planning and execution than CA 3. Maneuver on two axes requires plans for fire support of each maneuver force as well as the coordination of the assault.
- (2) CA 2, although appearing relatively simple, is the most complex plan. This is brought about by the seizing of an intermediate objective that will require a temporary defensive posture,

and the coordination required to continue the attack on converging axes. Fire support coordination will be more difficult if constant changes are made in the actual operation.

- (3) CA 3 is the simplest way the commander can conceive to accomplish his mission. Control is centralized, the use of one axis, the ease of fire support, all lend to the simplicity of the plan.
- (4) CA 3 is selected based on this principle.

l. Conclusion. As a result of the commander's analysis of the three courses of action, based solely on the principles of war, CA 3 was favored.

2. Summary

Although the application of the principles of war is more apparent at higher levels, they can and must be applied as illustrated above at all levels. The platoon leader as well as the field army commander, must apply the principles of war to every situation. The seasoned commander, in arriving at a course of action, will normally concurrently consider the factors of METT and the principles of war. A less experienced commander may find it helpful to arrive at courses of action by initially considering the factors of METT only and then by the application of the courses of action against each of the principles of war to establish the relative validity of a course of action before final selection of the best course of action.

APPENDIX IX OPERATION ORDERS AND PLANS

Section I. COMBAT ORDERS

1. General

a. *Classes of Orders.* Orders are of two general classes: routine and combat.

- (1) *Routine orders* include general and special orders, court-martial orders, bulletins, circulars, and memorandums.
- (2) *Combat orders* pertain to operations and administration in the field. They are classified as directives, letters of instruction, operation orders, administrative orders, and standing operating procedures.

b. *Definitions.*

- (1) *Directive.* A directive is any communication that initiates or governs action, conduct, or procedure. It is a general term, including all forms of orders and instructions. It is used most often to indicate broad aims, policies, or strategic plans promulgated by commanders of theater or higher commands.
- (2) *Letter of instruction.* A letter of instruction is intended for guidance and control of the operations of a large command. It may consist of one or more paragraphs dealing with the broad phases of operations. When issued, it follows the sequence of the 5-paragraph operation order to the extent possible. Letters of instruction are issued normally by Army and higher commanders and have the same authority as operation orders.
- (3) *Administrative order.* An administrative order is given by a commander, announcing to elements of the command the plan to provide combat service support for operations.
- (4) *Standing operating procedure.* A standing operating procedure (SOP)

is a set of instructions to be followed by a particular unit for the performance of the features of operations, both tactical and administrative, that the commander desires to make routine.

- (5) *Operation order.* An operation order is given by a commander setting forth the situation, the mission, his decision and plan of action, and such details of method of execution as will insure coordinated action by the whole command.
- (6) *Fragmentary order.* A fragmentary order, normal to armor operations, is a combat order, containing information of immediate concern to certain subordinate units. It may omit elements normally found in a complete combat order that (1) have not changed since issuance of the last complete order; (2) are not essential to the performance of the mission; (3) might delay or complicate transmission; and (4) are unavailable or incomplete at the time of issue. The advantage of fragmentary orders is *timeliness*. In a rapidly moving situation, there may not be time to publish and distribute a complete order to all subordinate units. In such an instance, fragmentary orders are issued. With this type of order, separate instructions are sent to one or more subordinate elements, prescribing to each element its part in the operation. They are concise, but not at the expense of clarity or omission of essential information. In armor operations these instructions are usually oral. The content follows the same sequence as the complete order.

(7) *Warning order.* A warning order contains advance information to enable subordinate units to prepare for operations to be initiated by later orders. They are issued usually as brief, oral or written messages, with the content following the same sequence as the complete order. Information or instructions contained in warning orders are usually repeated in the order that follows.

2. Operation Orders

Operation orders may be issued orally or written. An oral order may be recorded verbatim or in note form by the receiver. A complete copy of all orders is kept by the staff of the issuing commander. They may be prepared

on an operation overlay or operation map accompanying the order as an annex, with the order written on the overlay (overlay-type operation order); with no overlay, in which case items normally presented graphically on an overlay or map are described in the body of the order; or by annotating a map or sketch. They may be issued directly to the subordinate commanders or their representatives, or may be transmitted by signal communication facilities, liaison officer, or messenger.

3. Form

Regardless of the manner in which the operation order is issued, it always follows a prescribed format which facilitates completeness and note-taking. This format contains a heading, body, and ending as follows:

(Classification)

(Changes from oral orders)

Copy No. _____
Issuing headquarters
Location of CP
Date-time group
Message reference number

OPORD _____

(Numbered serially)

References: (Maps, airphotos, etc.)

Time zone: Used, throughout the order, when execution will take place in a different time zone from place of issue.

Task organization: The task subdivisions or tactical components that will comprise the entire command, together with the name and grade of the commanders, when appropriate.

1. SITUATION

Such information of the general overall situation as may be essential for subordinates to understand the current situation.

- Enemy forces: Composition, disposition, location, movements, identification, capabilities, and indications.
- Friendly forces: Pertinent information of own forces, other than those organic or attached.
- Attachments and detachments: Units attached to or detached from the issuing unit for this operation, including the effective time. Reference to "task organization" is usually sufficient.

2. MISSION

A clear, concise statement of the task to be accomplished by the issuing unit and its purpose.

3. EXECUTION

- The first subparagraph is entitled "concept of operation" and provides a brief summary of the commander's tactical plan to accomplish his mission.
- In subsequent lettered subparagraphs the specific tasks are given for each element of the command charged with the execution of tactical duties.
- In the next to last subparagraph instructions to the reserve units are given.
- The last subparagraph is entitled "coordinating instructions" and will contain the details of coordination and control measures applicable to two or more units of the command. For example: "Illumination plan will be implemented only on order of commander, Task Force 2/1, or, in emergency, by commanders of Teams A and B." If the order is not effective upon receipt, the effective time will be indicated in this subparagraph.

4. ADMINISTRATION AND LOGISTICS

Specific instructions concerning administration and logistics for the conduct of the operation.

5. COMMAND AND SIGNAL

- a. Signal: A reference to the index of signal operation instructions in effect. Special instructions relating to the use of signal communication, for example: Emergency signal to call for illumination: Green star cluster.
- b. Command: Location of command posts; location of commander.

- c. Axis of command posts displacement: One or more future CP location.

Acknowledge:

(Commander)

Annexes:

Distribution:

Authentication.

(Classification)

4. Discussion of the Form

a. *Classification.* Operation orders are assigned the lowest classification consistent with their proper protection. The classification will be as prescribed in appropriate regulations. For training purposes, the actual classification of the order is not entered, but the word "classification" is shown on the top and bottom of each page of the order.

b. *Heading.* The heading contains the following 9 items, if applicable.

- (1) *Changes from oral orders.* This space will be used only if oral orders regarding this operation have been issued previously and if this order either confirms or changes them. If there were no oral orders, this space will remain blank. All entries made will be enclosed in parentheses. In the case of no change, the statement will appear as "(No change from oral orders)." If there is a change, a statement such as "(Change from oral orders, par. 3b, c, and d)" will be used.
- (2) *Copy number.* The issuing headquarters will allot a copy number to each copy of an order and *maintain a record* showing the specific copy issued to each addressee. The copy number will be entered in the following manner, "Copy No. 3."
- (3) *Issuing headquarters.* The official designation of the command issuing the order. When secrecy requires, a code name may be used.
- (4) *Location of CP.* The physical location of the headquarters issuing the order. The map coordinates will always be included. The name of the town or

place will normally be included. The name of the country will be included if appropriate.

- (5) *Date-time group.* The date and time are shown by a group of six digits, followed by the month and year, for example, 061030 Sep 1961. The date-time group means the date and time at which the order is signed. It is also the date and time the order is effective, unless stated to the contrary in "coordinating instructions."
- (6) *Message reference number.* The message reference number consists of letters or numbers, or a combination of letters and numbers, which in no way refer to the fact that the reference number is connected with an operation order. The reference number is assigned from the SOI by the operations officer.
- (7) *Title and number of order.* Operation orders of a command are numbered successively during a calendar year. If two or more are issued on the same day, they are given consecutive numbers.
- (8) *References.* The reference designates the map, sketch, or air photograph required, giving the country or geographical area, the scale, and the name or number of sheets in sufficient detail to identify the exact references used in the preparation of the order, for example, Reference: Map, GERMANY, 1:50,000, NURNBERG sheet.
- (9) *Time zone.* This item will be omitted unless the unit will execute the order in a different time zone from the time zone in which the order was issued.

If used, it will appear with the time wherever it appears in the order.

c. Body. The body will consist of the task organization (when used) and five main paragraphs. Each paragraph will be given a heading, in capital letters. All major subparagraphs will be given headings. The initial letter of the first word and proper nouns in the headings of the major subparagraphs will be capitalized. No headings will be underlined.

(1) *Task organization.* This listing will include the title of each subordinate element, the name and grade of each element commander when appropriate, and the subordinate units of each element. If the task organization is listed in this manner, the titles of the forces only are used in paragraph 3. Missions are assigned to subordinates in paragraph 3 and the composition of the elements need not be listed again. If the task organization is lengthy, it may be included in an annex to the order, and reference made to the annex. Units in a support status may be shown under task organization if followed by "(spt)" or "(DS)" as appropriate.

(2) *Situation.* Paragraph 1 will have 3 major subparagraphs, and under each subparagraph, will be given a brief description of the situation. This paragraph is devoted exclusively to information and contains no instructions of the commander. The three subparagraphs are as follows.

(a) *Enemy forces.* Paragraph 1a contains information of the enemy that is likely to affect the accomplishment of the mission. A distinction should be made between factual information and conjecture. Information contained may be supplemented by reference to a published intelligence annex, a periodic intelligence report, or an intelligence summary. The paragraph may consist of such reference only, if practical. In small units, the enemy situation may be shown on the operation overlay if it does not detract from the graphic

portrayal of the scheme of maneuver.

(b) *Friendly forces.* Paragraph 1b will include information of the next higher unit, adjacent units, and units supporting the operation that are *not* organic or attached, and that may affect the action of subordinate commanders and bear upon the accomplishment of their mission. Listing of friendly forces is in a definite sequence, as follows:

1. Higher units (minimum, next higher unit).
2. Adjacent units.
3. Supporting units.
4. Artillery units in numerical or alphabetical order.
5. Remainder in any order.

Much of this information is obtained from the orders of the next higher commander.

(c) *Attachments and detachments.* Listed in paragraph 1c are units attached to or detached from the issuing unit for this particular operation. Any other existing detachment or attachment may be shown as "remains detached (attached)." The effective time of attachment or detachment is stated if it differs from the effective time of the order. When attached units are shown under the task organization, a remark in paragraph 1c such as "task organization" will be substituted for the listing of the attached unit.

(3) *Mission.* There will be no subparagraphs in paragraph 2. This paragraph will contain a clear, concise statement of the task to be accomplished by the commander and its purpose. The mission will normally include the *who, what, when, and why* of the commander's decision. It is always stated in full even though it is shown graphically on an operation overlay or map.

(4) *Execution.* Paragraph 3 gives the concept of operation and assigns definite tasks or missions to each element of the command, organic, attached, or

under operational control, that is charged with the execution of tactical details for carrying out the mission as set forth in paragraph 2. A separate lettered subparagraph is assigned to each element of the command mentioned above.

- (a) The first subparagraph is entitled "concept of operation" and contains a brief summary of the concept of operation announced by the commander. The concept includes as a minimum the scheme of maneuver and the plan of fire support. Units that do not include organic or attached artillery units refer to the fire support annex. General terms are used.
- (b) Subsequent subparagraphs, down to but not including the reserve subparagraphs, are assigned to subordinate elements in alphabetical or numerical sequence. For example, for a battalion task force the sequence is as follows:

Tank or infantry companies in alphabetical order.

Armored cavalry platoon.

4.2-inch mortar and Davy Crockett platoon.

Other combat and combat support units, if attached or under operational control, in alphabetical order.

- (c) Units in *support* of the operation will *not* be given instructions in this paragraph.
- (d) The next to the last subparagraph is headed "Reserve," and contains all elements of the command designated as reserve, whether they are in reserve at the time the order becomes effective or later.

1. The listing of two or more elements of the command in the reserve subparagraph does not necessarily indicate a single command. If one element is attached to the other in reserve, the attachment will be shown by the normal method of showing attachments.

2. If a unit is to be in reserve at the time the order becomes effective it will be listed in the reserve subparagraph only. All instructions to this reserve unit for reserve missions or later missions as a committed unit will be shown in the reserve subparagraphs. If the unit is to be committed initially, but placed in reserve later the unit will be listed, together with its missions for initial employment, in the proper subparagraph in paragraph 3.

3. Missions up to and including the instructions to revert to reserve will be shown. The unit will be listed again in the reserve subparagraph, together with its reserve missions.

- (e) The final subparagraph of paragraph 3 is always entitled "Coordinating instructions," and contains tactical instructions and details of coordination applicable to two or more elements of the command. Essential elements of information (EEI) are shown, unless an intelligence annex is issued with the order. If, however, the commander wishes to emphasize this information, it may be stated in this subparagraph and repeated in the intelligence annex. If the order is not effective upon receipt, the effective time will be indicated. If there are no coordinating instructions, the word "none" will be placed after the heading. Concise movement instructions, not elaborate enough to require a separate movement order, may be placed in this subparagraph.
- (f) Instructions contained in the issuing unit's SOP normally are not repeated in the order.
- (g) If all the instructions to a unit are shown on an operation map or overlay, the unit title only is listed after the proper subparagraph letter. This indicates that the assigned

mission is shown on the overlay or map, the omission of further written instructions is intentional. If most of the instructions to a unit are shown graphically on the operation map or overlay, but one or more of the items cannot be shown, they are written under the subparagraph of the unit in the written part of the order. If the instructions are multiple, they should be itemized for clarity and given a priority of accomplishment, if assigned.

- (h) To use organic or attached units in a command to the maximum, the commander may attach some of his subordinate units to others. The commander receiving the attachment commands the attachment as if it were one of his own units. He can further attach it to one of his own subordinate units if he desires. In the preparation of operation orders these attachments are shown by indentation, in the task organization.

For example:

A/301st Engr Bn

1/E/301st Engr Bn

This is done so that subordinate units may understand clearly the command structure and how the commander is organizing his command for combat. Release from the attachment is *implied* when a new operation order is issued assigning the attached unit a new mission or showing it attached to another unit. Attachments in armor units are normally shown under task organization rather than in paragraph 3.

- (5) *Administration and logistics.* At battalion and company level, paragraph 4 normally contains necessary information or instructions pertaining to trains, messing, supply, and maintenance only. At brigade and higher, when the information is included in an administrative order in effect already or to be issued, paragraph 4 of the operation order may consist of only a reference to the administrative order, together with any special ad-

ministrative details not presented in the administrative order but affecting the operation. Subjects appearing in this paragraph are arranged in definite sequence, as follows:

- (a) General (including traffic circulation plan).
 - (b) Supply, beginning with class I, through class V, and miscellaneous supplies, including critical items such as allocation of nuclear weapons and prescribed nuclear loads.
 - (c) Transportation.
 - (d) Services.
 - (e) Evacuation.
 - (f) Personnel.
 - (g) Civil affairs.
 - (h) Miscellaneous.
- (6) *Command and signal.* Paragraph 5a contains signal matters and 5b command matters.
- (a) Paragraph 5a, "Signal," should contain, as a minimum, a reference to the index of the signal operation instructions (SOI) to be in effect. Any special instructions relating to signal communication, such as instructions on radio or pyrotechnics or restrictions on the employment of any means of communication, should be placed in this subparagraph.
 - (b) Paragraph 5b, "Command," may contain the location of the command post of the issuing unit and the next higher unit and may include instructions to select and report locations of command posts of subordinate units. The initial location of the commander is indicated.

d. Ending. The ending of the order consists of the acknowledgement instructions, signature of commander, list of annexes (if any), distribution, and authentication.

- (1) *Acknowledge.* Instructions will be placed under the final subparagraph of the body of the order and will not be given a heading paragraph number, or subparagraph letter. Instructions may be acknowledgement instructions or simply the word "acknowledge." The receiver acknowledges, using the mes-

sage reference number given in the heading of the order, unless directed otherwise. The acknowledgement of an order means that the order has been *received* and *understood*.

- (2) *Signature of commander.* The original copy of the order will bear the actual signature of the *last name* of the commander or his designated representative, and will be filed as a matter of record. All other copies will be authenticated by the S3, and in this case the commander's last name will appear above the commander's grade.
- (3) *Annexes.* Annexes are supporting documents attached to the order to amplify and supplement the instructions in the order. They are listed by letter and title as they appear in the order. Annexes will have the same heading and ending as the operation order except for the title of the annex, the message reference number (if not issued with the basic order), and the

authentication. If there is one annex listed, the word "annex" is used. If there are no annexes, this term may be omitted. In orders of units with organic or attached artillery units, the fire support annex is referred to in paragraph 3.

- (4) *Distribution.* This indicates to whom the order is distributed. If the distribution includes any allied unit, the entire distribution list will be written out. If the distribution list does not include allied units, or if the order does not involve interallied use, the distribution code as established by the unit SOP may be used. In the latter case this may be some statement such as "Distribution: A."
- (5) *Authentication.* All operation orders, other than the original (copy no. 1), will bear the signature of the unit S3. The word "OFFICIAL," and the signature, last name, and title of the S3 will appear.

Section II. TECHNIQUES OF PREPARATION

5. General

The purpose of uniform techniques in the preparation of operation orders is to employ a system familiar to all military personnel and to avoid inadvertent omissions. By consistent application of these techniques the confusion of order writing will disappear.

a. The military profession, like other professions, has developed a technical vocabulary. It is convenient and aids in the clear and rapid transfer of ideas. The use of this vocabulary in texts and instructions is natural. However, in an operation order it is essential that there be no possibility for misunderstanding by any subordinate of the exact intended meaning of each term used. With partially trained troops and staffs, the use of technical military language or unfamiliar abbreviations may cause misunderstandings. Therefore, the use of technical expressions in operation orders should be avoided if there is any danger of misunderstanding. Words of common understanding should be used even at the sacrifice of brevity. *Clarity is the first essential.*

b. Abbreviations save space and time. Except for abbreviations in common international use, for example, mm for millimeters, abbreviations will not normally be used in any operation order or operation plan circulated for interallied use. In operation plans or orders not involving interallied use, common abbreviations are used. Common abbreviations may include unit designations, such as 25th Armd Div, the month and year of the date-time group, and items such as OP, CP, FEBA, SOI, and obj. Persons who write orders and those who read them should not be required to memorize a list of abbreviations, nor be compelled to look up any that are unfamiliar. The author of the order when determining whether or not to use abbreviations should consider the recipients' familiarity with them. There is no hard and fast rule regarding their use. It is a matter of judgment.

c. Orders must be *clear, concise, and timely*. Clarity must not be sacrificed for brevity. The correct use of plain English is essential in operation orders, and rules for punctuation and grammar hold throughout. An order is faulty

if it does not convey the exact meaning and intention of the commander. Subordinates must be told in unmistakable terms exactly what their commander wants them to do.

d. In the interest of simplicity and clarity, the positive form of expression is used throughout operation orders. Such wordings as "The trains will not accompany the task force" is defective because the gist of the order depends upon the single word "not." The proper form is "Trains remain in present area." No doubt arises in the positive expression. Expressions similar to "attack vigorously" are avoided. Vigorously is not only meaningless and verbose, but weakens the force of subsequent orders in which the expression does not appear.

e. The numerical designation of army group, army, corps, and division is written in Arabic numbers, as "10th." Smaller units with numerical designations also use Arabic numbers. Some smaller units are designated by capital letter and some by functional title, as "armored cavalry platoon."

f. When a date and hour are determined and are to be published, they are expressed in a group of six digits. The first 2 digits indicate the day of the month, the next 2 the hour, and at the last 2 the minutes past the hour. Where the day, hour, or minutes can be expressed by single digits, each is preceded by a zero. For example, 07 for the seventh day of the month and 0605 for 5 minutes past 6 o'clock in the morning. The month and year follow the 6-digit date-time group; thus 25 minutes past 6 o'clock on the morning of 7 December 1962 is written 070625 Dec 1962 or 070625 December 1962. The date-time group will always include the year in the heading; in the remainder of the order, the year may be omitted. Terms such as "p.m.," "a.m.," "dawn," "daylight," "dusk," "EENT," "BMNT," etc., are not used in place of specific times. For example, in an order the term "Attack 030600 Sep" is used rather than "Attack at dawn, 03 Sep." When the date and hour are undetermined, or are not to be published at the time of issuance of the order in the interest of secrecy, the terms "D-day" and "H-hour" are used, and the selected date and hour are communicated later to those concerned.

g. All subparagraph headings will be followed by a colon. If there is only one item of instruction following the heading, it may be on the

same line as the heading. If there is more than one, the instructions should be itemized and placed below the heading.

h. Second and succeeding pages or orders, annexes, etc., will show short-title headings, including number (or letter), designation, and headquarters.

i. Compass points are used in place of the terms "right" and "left." If the situation indicates the advisability of including the terms "right" and "left" they are placed in parentheses immediately following the appropriate compass point, for example, "north (right)."

j. Areas are designated by northernmost point first and the remaining points in clockwise order.

k. Directions are given as from true, magnetic, or grid north.

l. Riverbanks are described as "left" or "right" from the point of view of an observer facing downstream.

m. Roads are identified by name or by sequence of points on the road, named in the direction of movement, and, when there is no movement, from left to right or rear to front, assuming that the person designating the road is facing the enemy. All other lines are designated in the same manner.

n. Boundaries indicate zones or sectors of action or movement and areas of responsibility. They are designated by easily distinguishable terrain features in the sequence in which they occur on the ground. This sequence is given from rear to front in an advance, and from front to rear in defense and retrograde.

o. Geographical names of definite areas, cities, towns, rivers, mountains, and places that are named specifically on a map are written or printed in capital letters. When referring to a hill by number, the word "HILL" will be written in capital letters for prominence in the order. The spelling in the order must be the same as on the map.

p. The first time a place or feature is mentioned in the order, the grid coordinates will be added in parentheses after the name of the place or feature. Thereafter where the place or feature is mentioned, the grid coordinates are not required unless there is a possibility of misunderstanding. When grid coordinates are used by themselves, and not in apposition to a place

or feature, they will *not* be inclosed in parentheses.

g. Orders giving missions for subordinate units should prescribe only those details or methods of execution that are necessary to insure that the actions of the subordinate unit will conform to the plan of operation for the force as a whole. A commander does not charge subordinate commanders with decisions that are his responsibility, nor does he trespass on their initiative by prescribing details of execution that lie within their province. See paragraphs 43 through 47 for a discussion of this guidance.

6. Operation Overlays and Overlay-Type Orders

a. An operation map or operation overlay complements the oral or written order. It promotes clarity, accuracy, and brevity by conveying information and instructions graphically. It contains instructions for coordination, including assembly areas, location of command posts, lines of departure, time of attack, axes of advance, boundaries, nuclear safety lines, phase lines, objectives, and bomblines. Other instructions and information that can be shown graphically may be included (fig. 59).

b. An operation overlay is prepared to portray graphically those instructions that can be represented pictorially by the use of conventional symbols. If the written part of the order is brief, it is preferable to write it on the overlay (overlay-type operation order). If the written part of the order is long, it may be written on separate paper, and instructions that can be portrayed graphically may be placed on an overlay issued as an annex to the operation order. Regardless of which type operation order is used, the techniques of preparation of the written part of the order and the overlay part are similar.

c. Military symbols are used on overlays to portray information and instructions graphically. To prevent the overlay from becoming cluttered with details, it should contain only the graphic information necessary for a clear understanding of the order.

7. Annexes and Appendixes to Operation Orders

a. *Annexes.* Material of a plan or order may

be put into annexes to preserve brevity, clarity, and simplicity in the body of an order.

- (1) When information that is used to amplify a plan or order is limited in application to the command as a whole, or is primarily technical in nature, it may be included in an annex.
- (2) Annexes are separate documents attached to and forming a part of complete plans and orders. Information given already in a plan or order need not be repeated in an annex. (Forms or *checklists for most types* of annexes are found in FM 101-5).
- (3) Annexes are issued to all units or agencies whose actions are affected by the annexes. Unless there is good reason to the contrary, such as security, each copy of a plan or order is issued complete with all annexes.
- (4) Even when accompanied by annexes, the order itself should contain all information essential to the effective employment of the elements of the command. Staff officers and subordinate commanders should not have to read and digest an entire annex to determine the basic organization and employment of a single arm.
- (5) Maps, sketches, or overlays are used frequently as annexes. When the written part of a plan or order is placed directly on a map or overlay, the map or overlay then becomes the plan or order, and is not an annex.
- (6) Annexes are prepared by appropriate staff officers and submitted to the commander for approval before issue. *Annexes are lettered alphabetically in the sequence in which they are mentioned in the basic order*, for example, Annex A, "Intelligence," or Annex B, "Operation Overlay." The operations officer, who is responsible for the preparation of the operation order, will assign letters to the annexes of an operation order. Headings and endings of annexes are similar to those of the basic operation order. The title of the annex identifies it with the basic operation order, such as "Annex B (Operation Overlay) to Operation

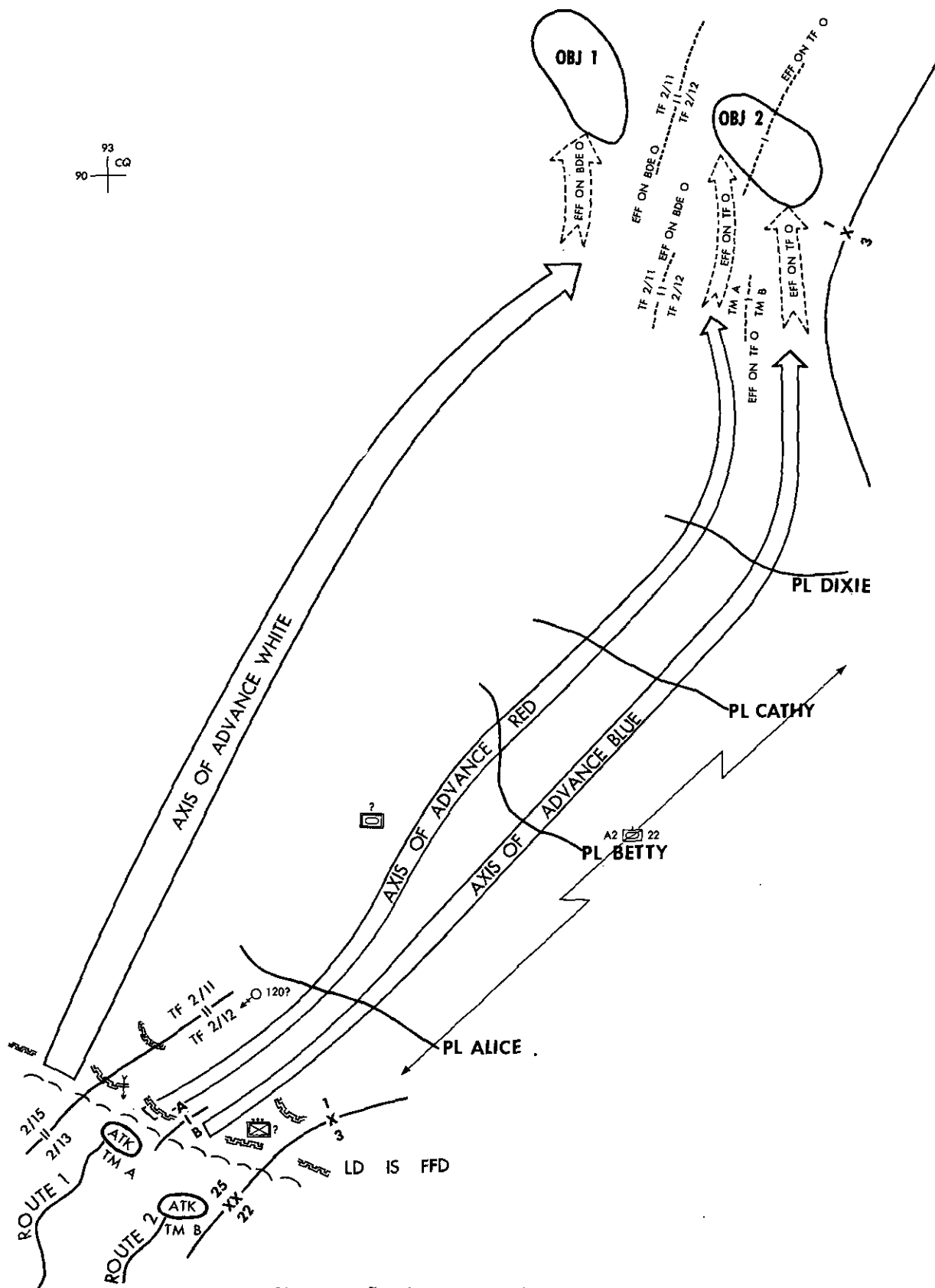


Figure 59. Graphic part (overlay) of OPORD 4.

Order 6." The original of an annex to an operation order is signed by the commander. Copies of the annex are authenticated by the unit staff officer having primary interest in the field of the annex; thus the operations officer would authenticate a signal annex to an operation order, and the intelligence officer would authenticate an intelligence annex.

b. Appendices. Appendices contain additions that are necessary to amplify an annex. They are numbered serially with Arabic numbers, for example, "Appendix 1 (Illumination Plan) to Annex C (Fire Support Plan) to Operation Order 6."

c. References to Annexes and Appendices.

References to annexes and appendixes are used in operation orders as follows:

- (1) In operation orders, reference to an annex is made at the place in the order at which it first is desired to direct the reader's attention to the annex. References to annexes are made in subsequent paragraphs and subparagraphs wherever necessary. Reference to each annex must be made at least once in the body of the order and in the ending.
- (2) In the body of an operation order, an annex or appendix is referred to by giving both its letter or number and its subject.

Example. Annex C, Fire Supply Plan.
Appendix 1, Illumination Plan.

Section III. OPERATION PLANS

8. General

Plans for future or anticipated operations are issued as operation plans. The standard form for the operation plan is identical to that of the operation order, with the exception that operation plans have an additional paragraph, 1d, titled "Assumptions." The techniques of preparation, the rules governing attachments, and the like, are the same as for the operation order.

9. Assumptions

There must be a basic reason or reasons for each operation plan. The unit will make plans for future operations, basing these plans on certain changes in the friendly or enemy situation that will take place between the time the plan is prepared and the time it is ordered into execution. Therefore, the operation plan will contain a listing of changes that must occur before the plan will be executed. These changes are called assumptions, and are listed in paragraph 1d of the operation plan. They tell the subordinate commanders the circumstances under which the plan will be ordered into effect as an operation order.

10. Techniques of Preparation

a. Operation plans follow the same format as operation orders. When an operation plan is ordered executed, the subordinate commanders will treat the plan as an order and execute it accordingly. Therefore, *the operation plan must be written as if it were a current order just prepared for this operation.*

b. An operation plan becomes an operation order when the issuing headquarters notifies the units concerned.

Example. Operation Plan ALFA is effective 190600 Sep 62 as Operation Order 15. (Operation plans are usually given code names so as not to confuse them with operation orders.)

c. Once an operation plan has been issued, subordinate units are free to plan for the contemplated operation, and issue operation plans to their subordinates. However, the operation in effect at the time the operation plan is issued will continue. Once the plan is converted into an order, it will supersede the previous order in the same manner as any operation order. Operation plans must be complete enough to give instructions to all subordinate units.

Section IV. EXAMPLE OF OPERATION ORDER

(Classification)

(No change from oral orders except paragraph 3d.)

(Classification)

Copy No. _____
 1st Tk Bn, 1st Armor (TF 1/1)
 MUNNESTADT, (850640) GERMANY
 240100 Jun 19__
 RS 199

OPORD 4

Reference: Map, GERMANY, 1:50,000, KONIGSHOFEN (341) and
 MELLRICHSTADT (311) sheets.

Task organization:

Team A	Team B
(Capt De Graf, Comdr)	(Capt Lind, Comdr)
Co A, 1/1 Armor (—)	Co B, 1/1 Armor
1st Plat, Co A, 1/31 Inf	2d Plat, Co A, 1/131 Inf
Team C	TF Con
(Capt Mickel, Comdr)	Hq, Hq Co (—)
Co A, 1/131 Inf (—)	Armd Cav Plat
3d Plat, Co A, 1/1 Armor	4.2-Inch Mort and Davy Crockett Plat
	1st Plat, Co A, 301st Engr Bn (Spt)

1. SITUATION

a. Enemy forces. Annex A, Intelligence.

b. Friendly forces:

- (1) 1st Bde attacks 240630 Jun 19__ through elements 203d Inf Div; seizes crossings over _____ River in zone; on order continues attack to seize obj 1 and 2.
- (2) TF 1/11 Armor attacks 240630 Jun 19__ through 3d Bn, 33d Inf, along axis of advance WHITE; seizes crossings over _____ River in zone; on order continues attack to seize obj 1.
- (3) Trp A, 1/31 Cav, protects east (right) flank of 1st Bde.
- (4) 1/61 Arty Bn, DS 1st Bde, priority of fires to TF 1/1 Armor.
- (5) 9th TAF supports 20th Army.

c. Attachments and detachments: Task organization. Co C, 1/1 Armor, remains attached to 1/131 Inf.

2. MISSION

TF 1/1 Armor attacks 240630 Jun 19__ through 3d Bn, 13th Inf, to seize and secure crossings over the _____ River in zone; prepares to continue attack on order to seize obj 2.

3. EXECUTION

a. Concept of operation:

- (1) Maneuver: This operation will be an attack in line with Teams A and B abreast, Team B on the east (right), Team C follow Team A

(Classification)

(Classification)

initially, to effect a hasty crossing of the _____ River, with a continuation of the attack, on order to seize obj 2. Annex B, Operation Overlay.

- (2) Fires: A conventional preparation on enemy defenses will be fires H-10 to H-hour with on-call, time fire concentrations on bridges over the _____ River. A nuclear preparation will not be fired. Annex C, Plan of Fire Support.

b. Team A:

c. Team B:

d. Team C: Follow Team A initially; be prepared to assume mission of either leading team on order.

e. Armd Cav Plat: Maintain contact with TF 1/11 Armor on west (left) flank.

f. Mort and Davy Crockett Plat:

(1) GS.

(2) Priority fires, Team A.

g. Coordinating instructions:

(1) Coordination for passage of lines completed by 240200 hours.

(2) Order of march attack position: Route 1—Team A, command group, Team C; Route 2—Team B. Start point: Route 1, road junction coord 168395; Route 2, road junction coord 178405. Start point time 240615.

(3) EEL. What is size of tank unit vicinity 1002?

(4) Make maximum use of mounted assault of bridges under time fire.

4. ADMINISTRATION AND LOGISTICS

a. Fld tn: Remain in present location; revert to bde tn 240200 Jun 19__.

b. TF cbt tn: Move on order. Mess teams attached to company teams 240200 Jun 19__. Attachment terminates 240430 Jun 19__.

c. TF axis of supply and evacuation: Axis of advance RED.

5. COMMAND AND SIGNAL

a. Signal:

(1) SOI, index 1-5.

(2) Listening silence until crossing LD.

(3) Emergency signals: for calling time fire on bridges, green parachute; for lifting fires, red parachute.

b. Command:

(1) Command group follow Team A.

(2) Command post remain present location, prepared to move, on order.

Acknowledge.

GROSS

Lt Col

(Classification)

(Classification)

Annex A—Intelligence (omitted)

Annex B—Operation Overlay (omitted)

Annex C—Fire Support Plan (omitted)

Distribution: F

1/11 Armor

3d Bn, 13th Inf

1/131 Inf

1/61 Arty

Co A, 301st Engr Bn

Trp A, 1/31 Cav

OFFICIAL:

/s/ Hold

HOLD

S3

(Classification)

APPENDIX X

CONTROL MEASURES AND OVERLAY TECHNIQUES

1. General

The armor commander is guided by the control measures specified in orders from higher headquarters; he may specify additional control measures if they are essential to the operation. In armor operations the commander uses the minimum number to insure that the operation progresses according to his concepts and the least restrictive control measures possible, thus permitting subordinate commanders maximum freedom of action in executing their assigned missions.

2. Objectives

a. Purpose. Objectives may be used to provide unit of effort, to designate area responsibility during reorganization, or to facilitate change in direction. The assignment of an objective normally requires that the unit seize and control that objective until the mission is accomplished. Exceptions should be specified in orders.

b. Characteristics. An objective may be a terrain feature, a locality, or a hostile force.

- (1) Its seizure must be essential to the accomplishment of the unit's mission and should facilitate future operations.
- (2) Its seizure must be possible within the time and space limits imposed by the assigned mission, and within the capabilities of the force to which assigned.
- (3) It must be identified easily.
- (4) It must produce a convergence of effort.
- (5) Its seizure must compel the enemy to evacuate his position or risk destruction on it.

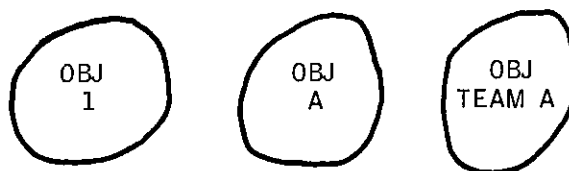
c. Assignment. The objective is normally specified by the next higher commander.

d. Control. The assignment of an objective indicates that control over it is to be gained and maintained until the mission is accomplished; the degree of control will normally be specified by the terms "seize" or "seize and secure".

- (1) *Seize.* The act of seizure is inherent in the assignment of an objective.
- (2) *Seize and secure.* The attacking unit must physically clear the enemy from the objective area.

e. Overlay Technique. Each objective is encircled by a line and identified by the abbreviation "Obj," and a number, letter, code name, or unit designation.

Examples.



3. Intermediate Objective

a. Purpose. An intermediate objective is assigned when its seizure is essential to the accomplishment of the mission. When an enemy cannot be bypassed the assignment of intermediate objectives may be required.

b. Characteristics. See paragraph 2b, this appendix.

c. Assignment. See paragraph 2c, this appendix.

d. Control. See paragraph 2d, this appendix.

e. Overlay Technique. See paragraph 2e, this appendix.

4. Assembly Area

a. Purpose. This is an area in which the command is assembled in preparation for further action. Normally the following is accomplished in the assembly area:

- (1) Issuance of orders.
- (2) Organization for combat.
- (3) Maintenance.
- (4) Supply.

b. Characteristics. Desirable characteristics include the following:

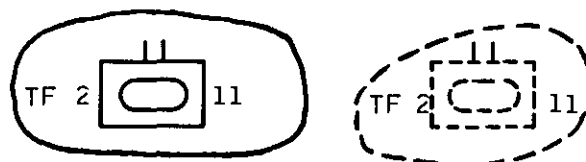
- (1) Provides passive protection from enemy nuclear attack by being—
 - (a) Located in broken terrain (to reduce blast effect).
 - (b) Elongated in shape, to present a less lucrative target.
 - (c) Large enough to disperse battalion-size units a minimum of 4,000 meters, perimeter to perimeter, or 6,000 meters between centers of mass.
- (2) Located beyond the range of enemy light artillery.
- (3) Provides adequate area for dispersion of units for passive protection from nuclear weapons.
- (4) Provides cover from direct-fire weapons.
- (5) Provides concealment from ground and air observation.
- (6) Facilitates security of the unit through the use of natural or artificial obstacles.
- (7) Avoids interference with other units operating in the area.
- (8) The terrain facilitates movement into, through, and out of the area.
- (9) Provides adequate and hardstand drainage.
- (10) Facilitates communication.

c. Assignment. Commanders assign assembly areas to their subordinate units, who subdivide them to their subordinate units. Desirably, battalion-size units require an assembly area 2,000 by 2,000 meters or a comparable area.

d. Control. Units will adhere to the assigned limits of the assembly area to prevent interfering with other units.

e. Overlay Technique. Inclosed by a line, the unit symbol is placed in the center. Proposed assembly areas are shown with broken lines.

Examples.



5. Attack Position

a. Purpose. This designates to units leading the attack, the area in which they are to deploy into attack formation.

b. Desirable Characteristics.

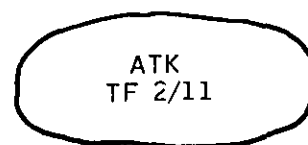
- (1) Covered from direct fire.
- (2) Adequate space to deploy the unit.
- (3) Close enough to the line of departure so that units can maintain attack formations without becoming disorganized before crossing.

c. Assignment. Attack positions are not designated for units larger than battalion task force. The brigade commander will normally designate the general area for the attack positions for each of the *leading* battalion task forces. The battalion task force commander will then subdivide the assigned area and a general area for the attack position for each of his *leading* company teams. The company team commander selects the exact position.

d. Control. Units will adhere to the prescribed limits of the attack position to prevent interfering with other units.

e. Overlay Technique. Inclosed by a line, with the abbreviation "Atk," placed in the center.

Example.



6. Routes of March

a. Purpose. They provide for the control and coordination of the movement of units from one point to another during a tactical covered march. In armor operations, multiple routes of march are used from the assembly area to the attack position to facilitate rapid clearing of the assembly area, and rapid movement to and exit from the attack position. This rapid and continuous movement provides passive protection against enemy nuclear attack. The commander assigning the routes of march will normally specify start and release points.

b. Characteristics.

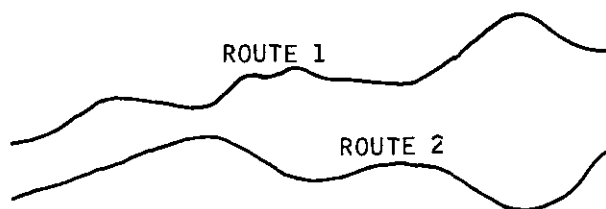
- (1) Be trafficable.
- (2) Facilitate security of the force while en route.

c. Assignment. The next higher commander normally designates routes of march and priorities.

d. Control. Units will adhere to the prescribed routes of march and observe priorities to prevent interference with other units.

e. Overlay Technique. Lines drawn on the route and labeled with the word "route," and a letter, number, code word, or unit designation.

Examples.



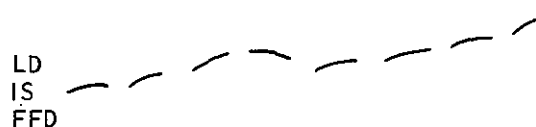
- (4) Requires minimum coordination with other friendly forces in the area.
- (5) Minimizes exposure to enemy direct-fire weapons.
- (6) If nuclear weapons are used, its location should conform to the commanders guidance on troop safety.

c. Assignment. The next higher commander normally assigns the line of departure.

d. Control. Units must cross the line of departure at the time specified.

e. Overlay Technique. Forward friendly dispositions are to be the line of departure.

Example.



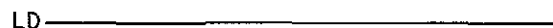
Present positions of the attacking force are to be the line of departure.

Example.



Other than the FFD or PPOS. Then it is designated by a line drawn according to characteristics and labeled LD.

Example.



7. Line of Departure

a. Purpose. This coordinates the commitment of units to the attack at a specified place and time. The line of departure (LD) may be the existing line of contact or it may be a readily identifiable terrain feature.

b. Desirable Characteristics.

- (1) Clearly defined on the ground.
- (2) Approximately perpendicular to the direction of attack.
- (3) As far forward as the unit can advance without fighting.

8. Boundaries

a. Purpose. Boundaries designate areas of responsibility and coordinate movement and fires. Boundaries may be used in conjunction with other directional control measures to define clearly control and responsibility in areas where confusion may occur, such as in an area of penetration where maneuver room is limited, or to delineate responsibility on the objective.

b. Characteristics.

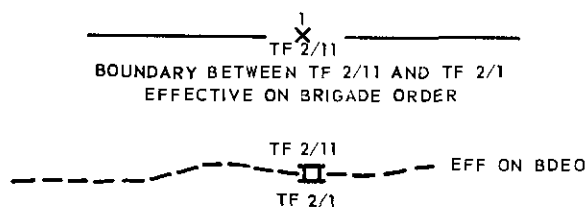
- (1) *Location.* Boundaries are drawn on easily discernible terrain features such as railroads or streams.
- (2) *Control.* Must not divide responsibility for key terrain features, or avenues of approach.
- (3) *Forward extension.* To indicate foremost territorial responsibility of the unit to which applicable, based on the limits of observation or the range of fires supporting the unit, whichever is greater.
- (4) *Rearward extension.* To—
 - (a) Assign roads, avenues of approach, and routes of withdrawal for use by units.
 - (b) Provide subordinate units adequate maneuver space for placement of forces.
 - (c) Coordinate fires and lateral movements.

c. Assignment. Designated by the next higher commander. Subordinate commanders may designate additional boundaries to their subordinate units as required. Boundaries are normally not assigned within a company-size unit between its platoons except in reconnaissance and security operations.

d. Degree of Control. Units (both organic ground and air) may fire or maneuver over a boundary with authority of the commander assigning the boundary, or with approval of the adjacent unit commander.

e. Overlay Technique. Line drawn on selected terrain with unit designation on both sides of a break, into which is inserted the symbol of the larger unit. Boundaries that are effective on order are shown with broken lines and labeled with the headquarters establishing the boundary.

Examples.



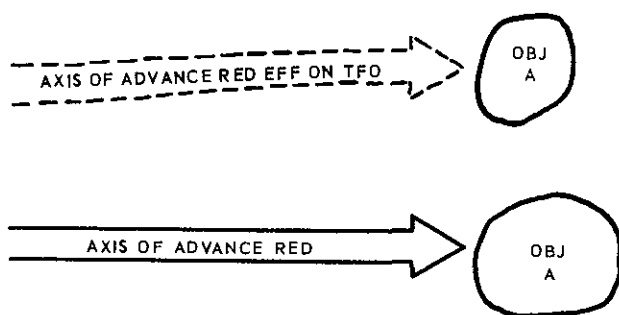
9. Control of the Direction of the Attack

There are three control measures, the axis of advance, zone of action, and the direction of attack, that are used to direct the attack toward the objective. One additional directional control measure, the route of advance, is applicable in security operations, and another, the infiltration lane, is applicable in penetrations by infiltration.

a. Axis of Advance.

- (1) *Purpose.* The axis indicates the general direction of movement of an attacking unit.
- (2) *Characteristics.* Normally it follows a well-defined terrain feature such as dominating terrain.
- (3) *Assignment.* The next higher commander normally assigns the axis of advance; one is assigned for each leading major unit; subordinate commanders may assign additional axis or axes of advance for their subordinate units. Boundaries may be used with axes of advance. Axes of advance are not normally assigned to platoons.
- (4) *Control.* A commander assigned an axis of advance may maneuver his troops and supporting fires freely to either side of the axis of advance; however, he must insure that a deviation in movement or fires from the assigned axis of advance will not interfere with maneuver of adjacent units; if it does, prior approval must be obtained from higher headquarters. Units are not required to clear enemy forces from the axis of advance unless ordered to do so.
- (5) *Overlay technique.* Open arrow extending in the direction of attack to the objective. The axis of advance is normally labeled with a code name or unit designation. It is drawn with dashed lines if effective on order. The width of the arrow is of no significance. The point of the arrow touches the objective.

Examples.



b. Zone of Action.

- (1) *Purpose.* This delineates an area and direction of movement when close coordination and cooperation is required between adjacent units. A wide zone permits maximum freedom of fire and maneuver; as a zone decreases in width its restrictiveness increases proportionately; however, narrow zones may be required by—

- (a) A requirement for a concentration of combat power.
- (b) Terrain limitations.
- (c) A requirement for close coordination between adjacent units. Units may be oriented in direction in a wide zone by the additional control of an axis of advance.

(2) Characteristics.

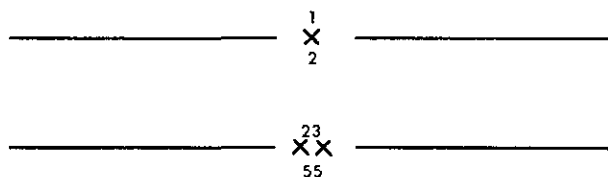
- (a) Is defined by the establishment of lateral boundaries and the line of departure.
 - (b) Should provide maneuver space for subordinate units commensurate with their mission and capabilities.
 - (c) Should wholly include key terrain features and avenues of approach to them.
 - (d) Should extend as a minimum beyond the objective to the depth necessary for the coordination of fire support.
- (3) *Assignment.* The next higher commander assigns the zone of action; subordinate commanders may subdivide the zone for their units. Zones of action are not normally assigned to platoons except in reconnaissance and security operations.

(4) Control.

- (a) When assigned a zone of action, units cannot fire or maneuver into an adjacent zone without coordination with the adjacent unit commander or the next higher commander. Zones are prescribed to avoid interference with the adjacent unit, and unwarranted massing of units.
- (b) Armor units are not required to clear enemy forces from a zone of action unless ordered to do so.

- (5) *Overlay Technique.* Designated by boundaries drawn on either flank of the zone.

Example.



c. Direction of Attack.

- (1) *Purpose.* A direction of attack is used when the commander considers it essential to designate a specific direction of attack, or to coordinate closely a plan of attack. The direction of attack is used principally in armor operations in the conduct of night attacks or in counterattacks.

(2) Characteristics.

- (a) Follows well-defined terrain features such as a road or ridgeline.
- (b) An azimuth may be used as the direction of attack.
- (c) Is the most restrictive means of controlling the direction of an attack.

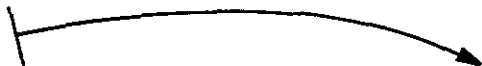
- (3) *Assignment.* The next higher commander assigns the direction of attack.

- (4) *Control.* The direction of attack is a highly restrictive control measure. A unit assigned a direction of attack must employ the bulk of its combat power along the direction of attack and cannot deviate from it except to maneuver against enemy forces inter-

fering with the advance. Because of its restrictive nature, a direction of attack should begin and extend where only this form of control is essential to the overall plan.

- (5) *Overlay Technique.* Arrow drawn to indicate the direction of attack.

Example.



d. Route of Advance.

- (1) *Purpose.* A route of advance is selected for a flank guard to delineate the specific route to be followed in the security mission. The route of advance is used in flank guard missions.
- (2) *Characteristics.*
 - (a) Follows well-defined terrain features such as a road or ridgeline.
 - (b) Should be interior to, and permit rapid access to, proposed blocking positions.
 - (c) Be located far enough from the force being secured to avoid interference with the movement of the force, but close enough to permit the flank guard to secure the area between the main force and the route of advance.
- (3) *Assignment.* The commander assigning the flank guard mission or the commander of the flank guard assigns the route of advance.
- (4) *Control.* A flank guard assigned a route of advance moves along that route. The flank guard clears the route enough to permit its own movement.
- (5) *Overlay Technique.*

Example.



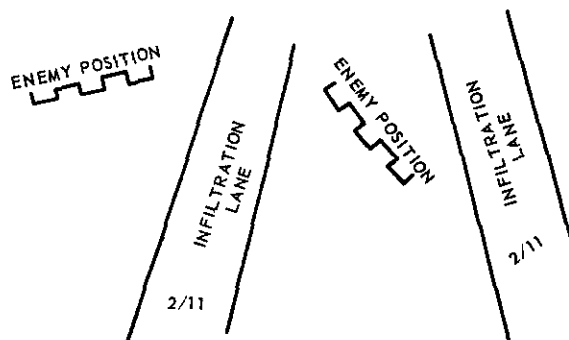
e. Infiltration Lane.

- (1) *Purpose.* The infiltration lane is used to prescribe routes to be used by infil-

trating forces and to coordinate fires and movement during the infiltration.

- (2) *Characteristics.*
 - (a) Delineated by boundaries.
 - (b) Of sufficient width to permit the infiltrating force to move by stealth.
 - (c) Avoids enemy locations.
- (3) *Assignment.* The commander ordering the infiltration assigns the infiltration line.
- (4) *Control.* Infiltrating units stay in the infiltration lane unless ordered out of it. During the infiltration, units must coordinate fires into the infiltration lane with the commander conducting the infiltration.
- (5) *Overlay technique.*

Example.



10. Phase Line

a. Purpose. Phase lines are used by the commander as a reference when he issues orders or receives reports, to delineate an area, to facilitate maintaining or changing a formation, and when regaining control of temporarily separated units. Phase lines are employed wherever the commander desires to orient and control his forces, such as—

- (1) Where it is visualized a penetration will be concluded.
- (2) On a difficult obstacle.
- (3) In conjunction with an axis of advance or zone of action covering great distances when units may require reorientation.
- (4) Immediately before a coordinated assault of the objective.

- (5) To indicate the distance from the main force that a flank guard will operate.

b. Characteristics.

- (1) Follows terrain easily identified from the air and from the ground.
- (2) May be oriented in any direction with regard to the movement or location of the force involved, depending upon the requirement for control.

c. Assignment. Each echelon of command may assign a phase line.

d. Control. Unless directed otherwise, units will report their arrival and clearance of phase lines without halting. The commander may enforce any other control and require any other unit activity at or within phase lines as necessary.

e. Overlay Technique. Line drawn on selected terrain, labeled with the abbreviation "PL" and identified by a code name.

Example.

PL
GREEN

11. Checkpoints

a. Purpose. They provide a means of reporting rapidly specific locations and information relative to the location or control of units. Checkpoints may be disseminated as a list of checkpoint numbers together with their map coordinates, or they may be indicated on an overlay. They should not be used as reference points in reporting enemy locations; these should be reported in the clear.

b. Characteristics. They are designated on conspicuous terrain features such as road junctions, stream junctions, bridges, and conspicuous buildings or groups of buildings.

c. Assignment. Each echelon of command may assign checkpoints.

d. Control. They are not restrictive unless so specified by the commander.

e. Overlay Technique. Circle inclosing a selected terrain feature, with a number inside the circle.

Example.

8

12. Contact Points

a. Purpose. They designate a point on the ground where two or more units are required to make physical contact.

b. Characteristic. They are indicated on easily identified terrain features.

c. Assignment. Each echelon of command may assign contact points.

d. Control. Units are required to establish physical contact at these points as directed by the commander. Contact may be made by liaison personnel, patrols, etc.

e. Overlay Technique. Square placed on a selected terrain feature with a number inside.

Example.

2

13. No-Fire Line

a. Purpose. The no-fire line is a line beyond which artillery units may fire without prior clearance from the direct support artillery of the supported unit.

b. Characteristic. It is located to avoid firing on friendly forces by friendly artillery.

c. Assignment. The location of the no-fire line is recommended by the supporting artillery commander and approved by the supported unit commander.

d. Control. Direct support artillery is authorized to fire short of the no-fire line in its own sector; other artillery units must obtain clearance from the direct support artillery before doing so.

e. Overlay Technique. Line with the abbreviation "NFL"; it may or may not appear on the operation overlay, but must appear on the artillery fire plan, artillery situation maps, and firing charts of all supporting artillery.

Example.

-----NFL-----NFL-----

14. Coordinating Points

a. Purpose. Coordinating points are specific points for the coordination of fires and maneuver between adjacent units.

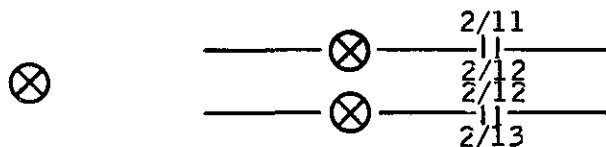
b. Characteristic. They are located on easily identifiable and accessible terrain features.

c. Assignment. Coordinating points are assigned by the higher headquarters of the adjacent units or as agreed upon by the commanders of the adjacent units.

d. Control. Commanders or their representatives coordinate at coordinating points to determine whether the area between their units should be covered by fires, barriers, physical occupation, or a combination of these means.

e. Overlay Technique. Circle drawn on the selected terrain feature, with an X placed in the center.

Example.



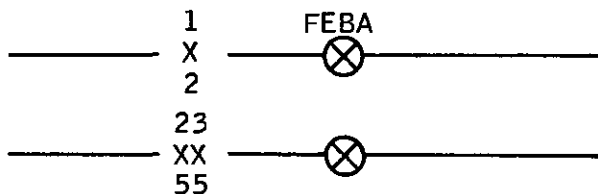
15. Sector

a. Purpose. This designates the defense area in which the unit will operate and for which it has defensive responsibilities.

b. Characteristics. Assignment and degree of control. Assignment, characteristics, and control are the same as for a zone of action in offensive operations. See paragraph 9b, this appendix.

c. Overlay Techniques. Designated by boundaries similar to a zone, with coordinating points drawn on the boundaries to indicate the forward edge of the battle area (FEBA).

Examples.



16. Delaying Position

a. Purpose. This is a location or series of locations from which friendly forces can effect maximum delay and attrition on an advancing enemy force.

b. Characteristics. Delaying positions are sought that incorporate—

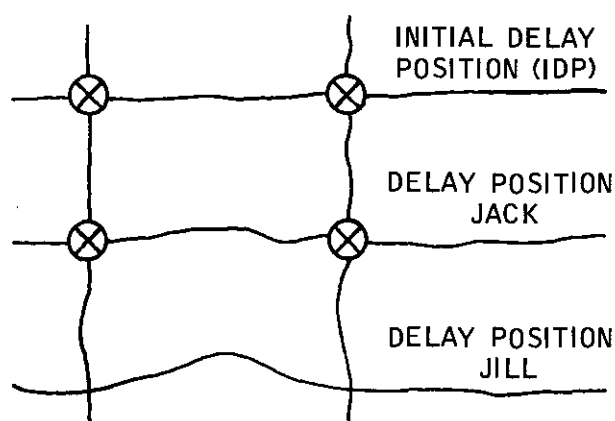
- (1) A series of cross compartments perpendicular to the enemy avenue of approach.
- (2) Natural obstacles to strengthen the position.
- (3) Good observation and long range fields of fire.
- (4) Concealed and covered routes of withdrawal.
- (5) A road net and areas providing good cross-country trafficability.

c. Assignment. The next higher commander designates delay position or positions. Intermediate commanders select additional delay positions to meet the delay requirements of the higher command.

d. Control. A delaying force must delay the enemy forward of a specific line until a stated time as a minimum. The period of time a delay position is to be held is normally stated opposite each position on the graphic portrayal of the operation order.

e. Overlay Technique.

Example.



17. Routes of Withdrawal

a. *Purpose.* This provides for the control and coordination of the movement of units from one point to another during a retrograde operation.

b. *Characteristics.*

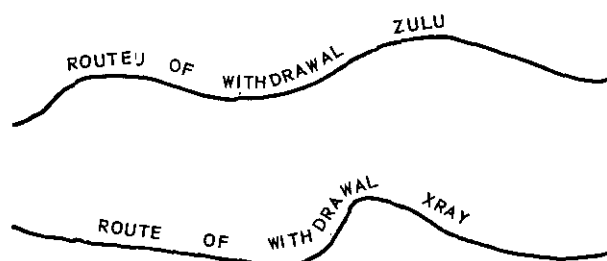
- (1) Be trafficable.
- (2) Facilitate security of the force while en route.
- (3) Avoid passage through friendly forces, if possible.

c. *Assignment.* The next higher commander assigns routes of withdrawal.

d. *Control.* To prevent interference with other units, units must adhere to the prescribed routes of withdrawal and observe priorities, if established.

e. *Overlay Technique.* Drawn on the route and labeled "Route of withdrawal" and a letter, number, code word, or unit designation.

Example.



18. Blocking Positions

a. *Purpose.* They designate locations from which units plan to conduct fixing force or security missions. Forces occupying blocking positions do not necessarily hold their position, but will fight offensive and delaying actions to accomplish the mission.

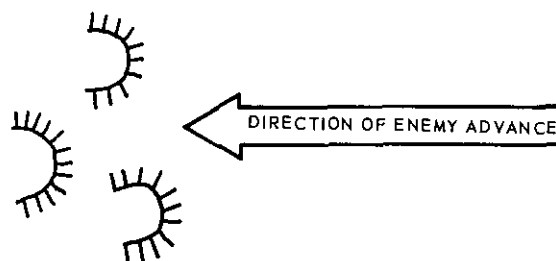
b. *Characteristic.* Blocking positions are located on terrain providing the best available observation and fields of fire into enemy avenues of approach.

c. *Assignment.* Any commander charged with a fixing force or security mission may assign blocking positions.

d. *Control.* Units assigned blocking positions occupy them as directed by the higher commander.

e. *Overlay Technique.* Drawn as a semicircle with the convex side hachured and directed toward the avenue of approach to be blocked.

Example:



APPENDIX XI
GUIDE FOR THE PREPARATION OF FIRE PLANS

Figure 60. Guide for the preparation of fire plans.

(Located in back of manual)

APPENDIX XII

HANDLING PRISONERS OF WAR

1. General

The S1 prepares and supervises the execution of plans for the collection and evacuation of enemy prisoners of war (PW's). He must insure that these plans conform to the directives of higher headquarters, and that they are sufficiently comprehensive. He coordinates with S2 for estimates on prisoners anticipated and facilities for any interrogation desired, and with S3 for necessary guards for prisoners while they are being evacuated. He coordinates with S4 for transportation to evacuate prisoners and with the battalion surgeon for evacuation of wounded prisoners.

2. Offensive

The evacuation of prisoners of war and establishment of collecting points in fast-moving operations pose a problem at brigade and battalion task force level, because of the continuous movement of the command post. To offset this problem, two procedures are employed—

a. The division MP company will normally establish a collection point on axes of advance or supply and evacuation of each committed brigade, which will facilitate evacuation directly to these collection points from battalion task force after immediate interrogation.

b. PW interrogation teams with armored divisions are mobile and operate with minimum facilities. At brigade and battalion task force level, interrogation of prisoners is limited to immediate information required, such as location and deployment of antitank weapons and defenses, enemy roadblocks, and presence of enemy tank units. In fast-moving offensive operations, interrogators are employed with forward elements of the battalion task force. Facilities for interrogation at brigade and battalion task force level are kept to a minimum, because PW's are questioned briefly on the spot

and evacuated to the division PW collecting point or turned over to nearby infantry units for evacuation. Selected PW's may be evacuated from battalion task force to brigade for further interrogation.

3. Defense

a. In defensive operations, emphasis is placed on the proper conditioning of prisoners of war for interrogation. This is accomplished by a smooth functioning and well-organized system for handling and evacuation. The system includes—

- (1) Disarming and searching.
- (2) Segregation according to rank, sex, nationality, and status.
- (3) Tagging to show time, place, and circumstances of capture and capturing unit.
- (4) Evacuation to the nearest PW collecting point.
- (5) Disposition of documents.
- (6) Procedure for evacuation of enemy wounded and dead.
- (7) Procedure for medical and religious care.
- (8) Safeguarding.

b. Evacuation of PW's is normally from point of capture to battalion task force and then to brigade PW collecting point. Preliminary interrogation attempts to develop information of immediate tactical value to the battalion task force and brigade commanders. Following the preliminary interrogation, PW's are evacuated to the division PW collecting point.

4. Evacuation Techniques

a. The evacuation of PW's from the front-line presents problems to the company team

commander. In fast-moving situations, the team commander must rely on attached or nearby infantry, returning ground or air vehicles. The company team commander must use every possible resource to assist in the evacuation. If the situation permits, the team commander may use any vehicle returning to the rear.

b. The battalion S1, in conjunction with battalion S4, normally has greater resources at his disposal for evacuation than does the company commander. The S1, however, must take advantage of all transportation returning to the rear to evacuate PW's.

c. Under some circumstances, the intelligence value of PW's may justify their evacuation by the temporary use of combat troops.

APPENDIX XIII

TANK UNITS, CONDUCT OF FIRE AND MOVEMENT BY A
MANEUVER FORCE

1. General

a. Armor units fight with fire and maneuver. Fire and maneuver consist of —

- (1) The base of fire, which may be composed of artillery and mortar units, TAC air, and naval gunfire and has the mission of providing fire to neutralize enemy capabilities.
- (2) The maneuver force, which is composed of tank and mechanized infantry units and has the mission of closing with and destroying the enemy.

b. Ideally, the maneuver force moves continuously in mass; that is, the entire force advances on the enemy without halting, while the base of fire neutralizes the enemy's capability for interfering with the advance of the maneuver force. This advance in mass is conducted at top speed. The combination of speed and the multiplicity of targets reduces the time the maneuver force is exposed to enemy fire, thus reducing its vulnerability and producing tremendous shock effect.

c. Under some circumstances, the base of fire or machinegun fire from moving tanks may be unable to neutralize enemy weapons that prevent continuous movement in mass. The maneuver force may be forced to engage the enemy with direct tank gun fire from defilade positions by designated elements while other elements continue the advance. This technique is called fire and movement.

d. Fire and movement is accomplished by and within the maneuver force. A distinction is made between fire and maneuver and fire and movement to emphasize the point that tanks close with the enemy and are not used in a base of fire. The distinction between fire and maneuver and fire and movement is shown graphically in figure 61.

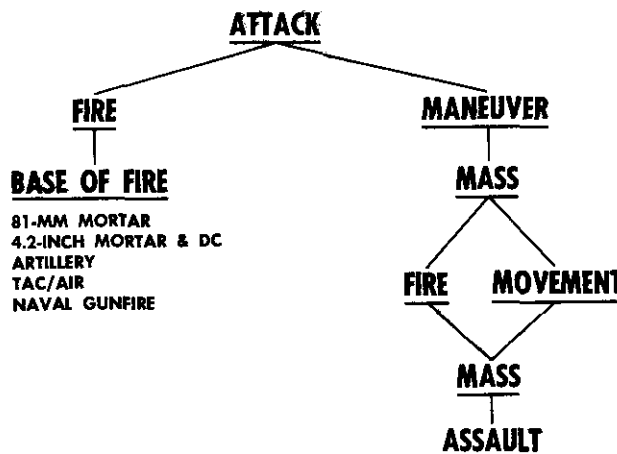


Figure 61. Relationship between fire and maneuver and fire and movement.

2. Fire Delivered by the Maneuver Force

a. General. In the fire fight, the armor unit commander seeks to capitalize on the armor protection, firepower, and mobility of the tank to close with, and destroy the enemy. Normally, this is best accomplished by advancing continuously in mass.

- (1) All measures are taken to make fires as effective as possible. The commander is alert to order any action that will improve the volume and accuracy of fire or to deliver fire from a direction or location that will provide an advantage over the enemy.
- (2) All measures are taken to reduce the effectiveness of the enemy fire. The commander uses cover and concealment to the maximum both for firing positions and for movement. Movements are made rapidly to avoid presenting a stationary target. The judi-

cious use of smoke may reduce enemy observation.

b. Fires During Continuous Movement in Mass.

- (1) The unit continues to move without halting.
- (2) The tank machineguns can be employed effectively while the tank is moving, but the accuracy of the unstabilized tank gun is reduced seriously.
- (3) Fires during continuous movement in mass are effective only within the relatively short range of the machinegun and against an enemy vulnerable to small arms fire.
- (4) Continuous movement in mass with machinegun fire is used in the assault of defended positions.

c. Fire and Movement. Fire and movement is used so that the force as a whole may continue to advance while elements of it halt temporarily to fire 1 or 2 rounds from the tank gun at known targets that prohibit continuous movement in mass. Fire and movement is conducted by two methods—movement by individual tanks and coordinated movement by bounds.

(1) *Movement by individual tanks* (fig. 62).

- (a) Each tank commander determines whether to fire the machinegun while moving or to halt to fire the machinegun or tank gun. The tank commander selects the firing position, the target, the time of fire, and the route between firing positions. In making these determinations, he must maintain, in general, his relative position in the platoon formation. The platoon leader insures that the platoon continues to move and may direct individual tanks to fire less and move more if necessary to insure that all tanks participate aggressively in the fight. The platoon leader may direct the fire of individual tanks when necessary.

- (b) The accuracy capabilities of both the machinegun and the tank gun

are best realized when fired from a stationary position.

- (c) Movement by individual tanks is effective against any type target except those requiring the concentrated fires of more than one tank.

- (d) Considerations when movement by individual tanks might be used are as follows:

1. In the advance to the assault when enemy tanks or other point targets threaten the accomplishment of the mission and cannot be neutralized by the base of fire or by machinegun fire while moving.
2. When a force is caught in the open by effective enemy fire and must move and neutralize the fire to prevent unacceptable losses.
3. In the assault when the presence of enemy tanks requires the use of armor-defeating weapons.

- (e) The advance by continuous movement in mass is resumed as soon as possible.

- (2) *Coordinated movement by bounds.* The unit commander selects the firing positions, designates who is to occupy the positions, and gives the order to displace from one position to another. The unit commander may designate targets, the time to fire, and the route between firing positions.

(a) *Alternate bounds* (fig. 63).

1. A part of the tank unit is ordered forward to a predesignated limit while the remainder of the unit fires on the enemy. When the leading element is in position, it fires on the enemy while the remainder of the unit advances past its position to a second predesignated limit. This alternation of movement is repeated as often as necessary. The tank company executes alternate bounds by platoons. When platoons are forced to execute alternate bounds, the platoon leader decides where and when a tank or tanks will move. The movement of all tanks is coordinated.

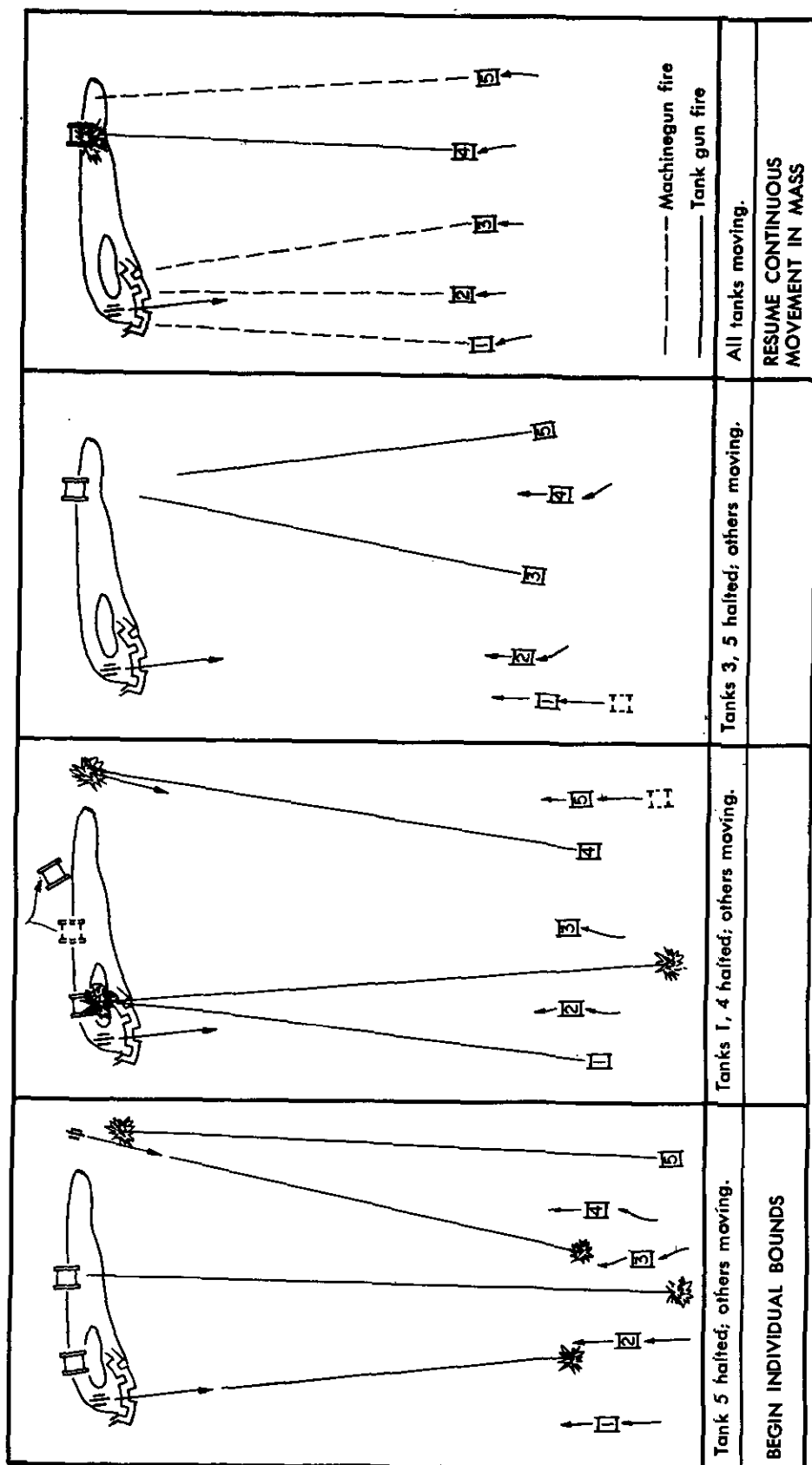


Figure 62. Movement by individual tanks.

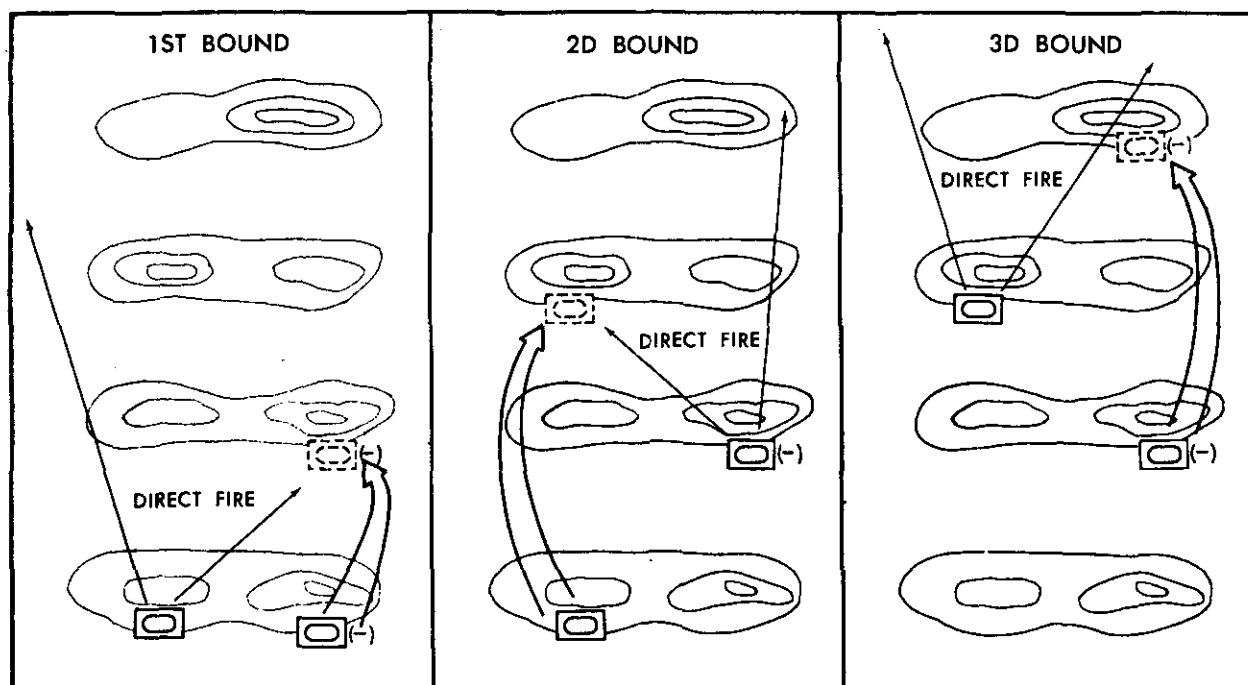


Figure 63. Movement by alternate bounds.

2. The fires of tanks in firing positions may be concentrated against those elements of the enemy that constitute the greatest threat to the unit.
3. The advance by continuous movement in mass is resumed as soon as possible.

(b) *Successive bounds* (fig. 64).

1. A part of the tank unit is ordered to a predesignated limit while the remainder of the unit fires on the enemy. Once the leading element is in position and firing on the enemy, the remainder of the unit advances to join the leading element. While the unit is together, the commander may halt all movement long enough to increase fires

on the enemy. The bounds are repeated as often as necessary. The tank company commander executes successive bounds by platoons. When platoons are forced to execute successive bounds, the platoon leader decides which tank or tanks will move.

2. Movement by successive bounds is the only method that offers an opportunity to concentrate the fires of the entire friendly unit. This occurs when all elements of the unit are on the same terrain feature before continuing to the next bound.
3. The advance by continuous movement in mass is resumed as soon as possible.

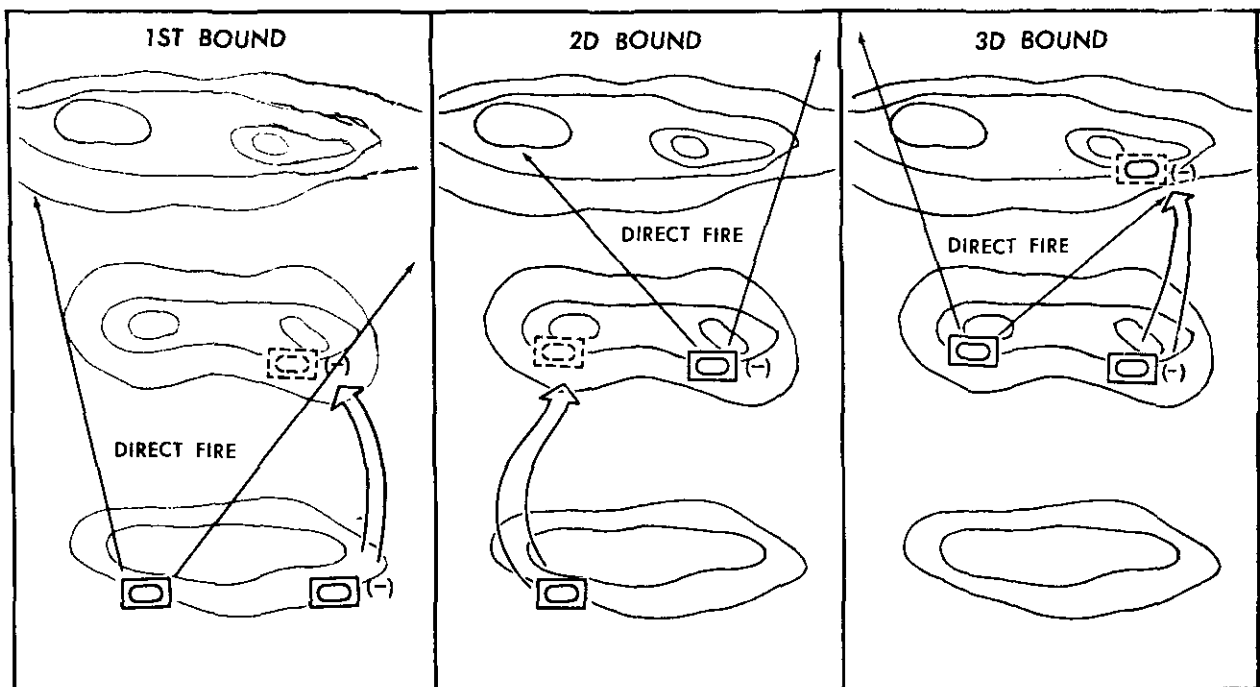


Figure 64. Movement by successive bounds.

APPENDIX XIV

ORGANIC FIRE SUPPORT

Section I. GENERAL

1. General

The armored division combat maneuver battalions support the scheme of maneuver with fires from organic weapons. The organic weapons considered are—

<i>Weapon</i>	<i>Unit</i>
4.2-inch mortar-----	Tank and Mech Inf Bn, and Armd Cav Plat.
Davy Crockett-----	Tank and Mech Inf Bn, and Armd Cav Sqdn.
81-mm mortar-----	Mech Rifle Co
antitank guided missile (ATGM).	Mech Inf Bn
106-mm recoilless rifle----	Mech Rifle Co

For information concerning weapons organic to the armored cavalry squadron see FM 17-86.

2. Tactical Missions for Organic Weapons

Tactical missions must be assigned organic fire support weapons of armor units in the same manner as tactical missions are assigned to artillery units. Tactical missions for fire support weapons organic to armor units are generally support, direct support, and support.

3. General Support (GS)

General support is the mission of supporting

the majority of the parent unit. The parent unit commander retains control of fires, movement, and supplies.

4. Direct Support (DS)

a. Direct support entails establishment of communication with the supported unit; dispatch of forward observers when applicable; advising on employment; fire planning; and displacement to conform to the plans of the supported commander.

b. When observers are not a part of the organic fire support unit TOE, the weapons leader must position his weapons to provide the most effective support.

5. Support

When organic fire support means of a combat maneuver battalion are attached to a subordinate unit, a mission of "support" will generally be assigned by the commander receiving the attachment. This is a mission-type order, permitting the organic fire support weapons leader to employ his weapons to best support the overall plan of operation of the unit to which attached.

Section II. THE MORTAR AND DAVY CROCKETT PLATOON

7. General

This section and sections III and IV discuss the general composition, missions, capabilities, and tactical employment of the mortar and Davy Crockett (DC) platoon organic to the headquarters company of the tank battalion, and the mechanized infantry battalion.

8. Missions and Capabilities

a. *Mission.* The platoon furnishes close and continuous indirect-fire support to its parent battalion.

b. *Capabilities.*

- (1) Delivery of a heavy volume of high explosive ammunition on area or point targets.

- (2) Delivery of subkiloton yields on area or point targets.
- (3) Delivery of smoke on area targets.
- (4) Battlefield illumination.
- (5) Delivery of chemical munitions on area targets.
- (6) Target marking for other weapons.

9. Organization

The mortar and DC platoon in general is self-sufficient operationally, but depends on its parent company and battalion for logistical and administrative support and, partially, for security. See the appropriate TOE for organization of the platoon.

Section III. THE 4.2-INCH MORTAR SQUADS

10. Mobility

The mortar squads are 100 percent mobile.

11. Armor Protection

The FDC and the four mortar squads are mounted in carriers, which when all hatches are closed provide all-round armor protection against the effects of nuclear, chemical, and biological weapons. When the main top hatch is open to permit on-vehicle firing of the mortar, the gun crew is exposed overhead.

12. Firepower

The 4.2-inch mortar is a high-angle indirect-fire weapon capable of delivering high explosive and chemical ammunition at a high rate of fire at ranges from 870 to 5,500 meters. Each carrier mounts a caliber .50 machinegun, and the platoon headquarters is equipped with rocket launchers for close-in protection.

13. Flexibility

The platoon possesses adequate tactical flexibility through its complete mobility and its capability of firing the weapon from a vehicular mount with minimum delay. The platoon is intended primarily to be used as a single firing unit; however, squads may be detached for independent missions for limited periods. The capabilities of a detached squad are limited.

14. Communication

The platoon is assigned a command net FM. All vehicles of the platoon are equipped with radios that are included as stations in this net. The platoon has wire communication equipment for control of the firing squads when in position. These multiple means of communication, coupled with its mobility and flexibility,

make the platoon highly responsive to command. A radio is provided for the communication link with the direct support artillery battalion.

15. Logistical Support

Logistical support must be provided by the parent organization. Continued operation of the platoon depends on timely supply of ammunition, fuel, and lubricants.

16. Fundamentals of Employment of Mortars

a. General. The employment of the mortar squads is based on their capability to provide close, continuous fire support. Firing normally is conducted from the on-carrier position. The platoon leader places himself where he can best control his mortar squads and the DC section. He is often with the battalion commander or command group. He may also control leading elements of the mortar squads during displacement, conduct reconnaissance, or visit the supported company teams for purposes of coordination.

b. Control. The mortar squads operate normally under battalion control and furnish fire support to the line companies or company teams. The mortars are usually kept together under the control of the platoon leader and not attached to a team; however, a priority of fires may be assigned to a specific team to weight that team's effort.

c. Concentration of Effort. All mortars normally fire the same mission. However, they have a capability of firing two missions concurrently.

d. Displacement. The mortars displace "by squads" or as a unit. One squad at a time may be displaced if maximum fire support is important.

e. Security. The mortar position is normally included in, or placed near, the position of a larger combat unit, to provide security. It has limited capacity for providing its own security.

17. Fire Requests

The platoon's forward observer (FO) teams operate with the line companies. These teams formulate and forward fire requests, and adjust fires. Mortar fires may be adjusted also by artillery FO's. In addition, all officers and key NCO's of the battalion must be able to call for and adjust fires if FO teams are not available. The procedures for requesting, coordinating, and adjusting fires are the same as for artillery fires. See paragraphs 274 through 278 and FM 6-135.

18. Liaison

a. The platoon leader maintains liaison with the battalion commander by personal contact or by radio, using the battalion command net.

b. Liaison with the line companies or company teams is provided by the forward observers, who use the mortar and DC platoon command net for contact with the mortar position.

19. Conduct of Fire

Fire is conducted in accordance with the principles outlined in FM 23-92.

20. Position Characteristics

The mortar position includes the four squad firing positions and the platoon command post. The primary requirement of the mortar position is that it is situated so the mortars can execute their fire missions. In the selection of positions the availability of other types of supporting fires should be considered. The position should have as many of the following characteristics as possible.

a. Permit maximum coverage of the area of operations of the supported unit.

b. Provide concealment, defilade, hardstand and relatively level firing positions.

c. Permit vehicles to enter through concealed and covered approaches.

d. Facilitate communication with the supported unit and the battalion command post.

e. Take advantage of security provided by other units.

f. Avoid interference with other units.

g. Take advantage of routes for displacement.

h. Provide adequate area for dispersion.

i. Provide adequate area for, and routes to, alternate and supplementary positions.

21. Tactical Marches

a. Platoon Position. The mortar position in a tactical march is prescribed in the battalion march order. The position of the mortars is decided upon after an analysis of its mission. When the march is toward the enemy and when contact is probable, the mortars are usually assigned to a position to the rear of the leading company team. When the battalion is marching in a direction other than toward the enemy, the mortars are assigned a position from which they can best furnish supporting fires to the bulk of the battalion should enemy action occur. When a requirement for supporting fires arises, the mortars double the column if necessary to reach a position from which the desired fires can be delivered.

b. Forward Observer Teams. FO teams accompany line companies of company teams as specified in the battalion march order. The FO should normally accompany the company team commander. Commanders of supported company teams are responsible for providing armored vehicle transportation, as required, for mortar platoon FO's.

22. Assembly Areas

In an assembly area, the mortars should occupy a position that can be used without change for a firing position. The position should permit firing in all directions. The mortars are laid in the most likely direction of enemy attack. Wire communication normally is installed between the FDC and the mortars.

23. Offense

a. Position. The location of mortars is indicated in the battalion operation order. The platoon leader recommends a position after making a personal reconnaissance and coordi-

nating with the battalion S3 and the artillery liaison officer. The position must permit the furnishing of maximum fire support to the unit or units to be supported; if possible, it should permit firing in support of all attacking elements of the battalion, and should be located well forward to permit maximum use of the range of the mortar.

b. Plan of Supporting Fires. Before the operation, the platoon leader makes recommendations to the S3 with regard to preparatory and supporting fires. These should be coordinated with team commanders and the artillery liaison officer. Suitable targets are crew-served weapons, point or small area targets protected from effective flat-trajectory fire, reverse slopes and defiladed areas, and areas to be smoked.

c. Fires During the Attack. Fires may be prearranged or delivered on targets of opportunity. Prearranged fires are delivered as scheduled or on call. Forward observers should be alert to engage targets of opportunity. Priority of fires is normally specified before the attack.

d. Displacement. Plans for displacement are made before the attack. The platoon leader keeps the mortars well forward and notifies the S3 when displacement is necessary. If the mortars cannot displace as a whole, two squads are displaced, accompanied by necessary FDC personnel. When these squads are ready to fire, they take over the firing mission while the rest of the platoon moves forward to the new position. If maximum continuous fire support must be provided during displacement, the mortars may displace one squad at a time. Displacements should be completed quickly so that maximum fire can be resumed.

e. Action Upon Capture of the Objective. Additional supporting fires are planned and coordinated for defense of the objective and for continuation of the attack. Supply is accomplished at this time.

24. Defense

a. Position. The mortar position is selected in accordance with the considerations listed in paragraph 20.

b. Plan of Supporting Fires. Concentrations for long range fires, close defensive fires, fires

within the defensive area, and barrages for final protective fires are preplanned and are included in the plan of fire support. Fires must be planned to support friendly counterattacks.

c. Division of the Platoon. The mortars are not normally divided physically except to provide continuous fire support during displacement (par. 23d).

d. Employment. The mortar squads should be in one location, positioned to support any element of the battalion. If the width of the battalion area makes it impossible for the mortars to support effectively all battalion elements, they may be positioned initially to support elements in the most critical area. The mortars must be prepared to move to preselected positions anywhere in the battalion area.

25. Retrograde

a. Positions. Positions are reconnoitered before the operation. They are echeloned in depth.

b. Plan of Supporting Fires. Concentrations are preplanned in depth.

c. Movement. Routes for displacement are preplanned. Displacement is conducted as outlined in paragraph 16d.

d. Employment. The mortars are normally positioned immediately behind the initial delaying position. The fires of the mortars should engage advancing enemy columns at maximum ranges. Close-in fires, fires in support of the counterattacking force, if any, and fires in support of the delaying force should be preplanned and integrated into the plan of fire support. When a displacement is made, the bulk of the mortars should be in position behind the new delaying position before the displacement of the delaying force. The remainder of the mortars displaces with or immediately ahead of the delaying force.

26. Special Operations

In such operations as attack in towns, attack of a fortified area, defense against airborne attack, or other specialized combat actions, the factors peculiar to the operation must be considered in the assignment of mission, decentralization of control, and positioning of the platoon.

29. River-Crossing Operations

The mortar carrier can "swim" fairly gentle streams at not more than 4 miles per hour. Because of the weight of the loaded carrier, offloading preparations are necessary before it can cross a stream in this manner.

a. Preparation of Carriers. The loaded weight of each carrier must be reduced to approximately 21 tons (approximate weight combat-loaded is 23¼ tons). This is done by removing nonessential equipment and reducing the number of personnel. At least half the crew, the mortar, operational equipment, essential communication equipment, and half the basic load should be left on the carrier. The remaining squad personnel cross in the FDC carrier. If possible, one or more carriers off-

load on the far bank to ferry across additional ammunition. Mortars may be fired from ground mounts during this operation.

b. Control Personnel. The platoon leader crosses in the FDC carrier. The platoon sergeant remains on the near bank with the wheeled vehicles and any equipment left behind.

c. Forward Observers. Forward observers cross in armored personnel carriers of supported mechanized infantry. The wheeled vehicles of the FO teams should be moved across by bridge, ferry, or deepwater fording kits as soon as possible.

d. Planning of Supporting Fires. Supporting fires are planned as for other attacks.

Section IV. THE DAVY CROCKETT SECTION

28. General

The Davy Crockett section provides nuclear fire support to its parent organization. It is capable of providing this fire support in all types of combat operations. Its flexible communication system and mobility foster its responsiveness to command, and the destructive effects of section fires provide commanders with an effective means of influencing the outcome of battle. The Davy Crockett section is capable of providing ground elements with low-yield nuclear direct- or indirect-fire support.

29. Factors Governing Employment

The following factors must be considered in planning for the employment of the Davy Crockett section.

a. Maximum and minimum ranges of the weapon system.

b. Slow rate of fire of the weapon.

c. Requirements for registration or adjustment to deliver accurate indirect fire.

d. The bulk, weight, and security requirement characteristics of the ammunition.

e. The coordination, including minimum safe distances and warning of troops, necessary for the employment of nuclear fires.

f. The time required to dismount and lay the weapon.

g. The requirement for frequent displacement of the section and its teams to minimize detection by the enemy.

h. Firing positions must be selected near other friendly units to enhance the security of the Davy Crockett element.

i. Ammunition allocations and availability.

j. Relatively low maximum ordinate of projectile trajectory.

30. Fundamentals of Employment

The following principles govern the employment of the Davy Crockett section.

a. The Davy Crockett weapons system supplements the firepower available to armor units. It must be employed in coordination with other fire support elements.

b. The Davy Crockett should be employed against the more dangerous enemy targets of opportunity because of its responsiveness to task force requirements.

c. Authority to fire a DC weapon is retained by the battalion commander regardless of the tactical mission assigned to the section or team(s).

d. Davy Crockett weapons must be employed well forward to maximize the range characteristics of the system.

31. Methods of Employment

The Davy Crockett section may be employed in two basic ways—general support or direct support of subordinate units of the battalion. The battalion commander, upon considering the factors of METT and the recommendations of the mortar and Davy Crockett platoon leader and fire support coordinator (artillery liaison officer), will designate the method to be used in assigning the mission to the section.

a. General Support. When it is employed in general support, control of the section is retained by the battalion commander; however, the section will answer calls for fire from all subordinate elements of the battalion, subject to the guidance announced by the commander. This method is preferred when—

- (1) The battalion commander desires to control all nuclear fires.
- (2) Ammunition is limited.
- (3) The battalion fire plan permits engagement of targets from a centralized location.

The battalion commander may designate certain units to receive priority of fire support from the Davy Crockett section. This will frequently permit retention of the section in general support.

b. Direct Support. The Davy Crockett section, or one or more teams, may be placed in direct support of one or more subordinate elements of the battalion. The battalion commander retains control of the section but teams fire in support of designated units. It is preferred when—

- (1) The battalion commander desires to retain control.
- (2) The battalion is dispersed widely and employment of the section in general support from a centralized location would not be feasible because of the weapon's range limitations.

Employment of the section by placing teams in direct support of battalion elements provides these elements with the desired fire support at the lowest echelon feasible without imposing the responsibility for combat service support.

c. Variations of Support. Combinations of the methods (*a* and *b* above) may be used to

support a particular operation. As a general rule, the heavy weapons system is employed in *general or direct support and the light weapon system employed well forward in direct support of company teams.*

32. Fire Planning

a. The battalion commander is responsible for the planning and coordination of Davy Crockett fires; however, the Davy Crockett section leader, in coordination with the battalion fire support coordinator and battalion mortar and Davy Crockett platoon leader, performs tasks incident to planning Davy Crockett fire support.

b. Based on the concept and other guidance announced by the battalion or supported unit commander, the section leader, in coordination with the fire support coordinator and the mortar and Davy Crockett platoon leader, plans the fires of his section. At section level, the fire plan is usually an overlay which, when time permits, is issued as an appendix to the battalion fire support plan. At team level, the fire plan will usually consist of concentrations plotted on the team leader's plotting board.

c. Fires are categorized either as scheduled or on call. Scheduled fires are planned on known or suspected enemy positions and are fixed in accordance with a prearranged time schedule, usually expressed in terms of H-hour. On-call fires are planned on known or suspected enemy targets and are fired as requested by supported unit commanders. In addition to scheduled and on-call fires, targets of opportunity may be engaged.

d. There are no specific rules as to the type of target to be engaged with Davy Crockett weapons. In general, targets should be selected which are vulnerable to the effects of the weapon and the destruction of which is essential to the accomplishment of the commander's mission. Suitable targets are as follows:

- (1) Personnel targets of platoon and company size. (Fires should be planned into areas likely to be occupied by units of this size, that is, assembly areas, attack positions, or avenues of approach.)
- (2) Enemy mortar, artillery, and missile launching positions.

- (3) Vehicular targets, mechanized or lightly armored vehicles.
- (4) Command posts of battalion size or larger.
- (5) Trains areas and supply installations.

33. Conduct of the Attack

a. Davy Crockett fires are delivered in accordance with section and team fire plans. Scheduled fires are delivered at the time and on targets prescribed. Upon completion of scheduled concentrations, the teams prepare to engage targets of opportunity or deliver on-call fires as requested by supported elements.

b. The section leader keeps informed of the situation and continues his estimate. Teams are shifted to alternate firing positions before hostile fire threatens their primary positions. Supplementary positions are occupied if it becomes necessary to meet enemy counterattacks.

c. Davy Crockett teams displace before the supported elements move beyond effective range of the weapon. Generally, they should begin displacement when supported units reach distances approximately one-half the range of the weapon. The section may displace in whole or by teams as the requirement for fire support and the tempo of the operation dictate. The section leader strives to have at least one weapon in position and ready to fire at all times; however, in fast-moving attacks and movement to contact, the Davy Crockett section or one or more teams will have to deploy from march column as requests for fire are received.

34. Defense

a. General. Davy Crockett weapons are employed in support of defensive operations applying the same general principles as for offensive operations.

b. Employment. Certain techniques that apply to the support of defensive operations are as follows:

- (1) The commander employs the method that best provides the fire support needed by battalion elements. Where possible, the section is employed in general or direct support to provide for maximum flexibility.

- (2) Fire planning in the defense is similar to that for offensive situations.
- (3) When the parent organization is part of the striking force, Davy Crockett fires are planned as described for offensive operations.
- (4) During conduct of the defense, Davy Crockett fires are delivered on pre-arranged concentrations and targets of opportunity as requested by supported commanders. Because of troop safety considerations associated with nuclear fires, the majority of concentrations are usually placed on targets in the midranges. Troops are warned in accordance with the unit SOP.
- (5) Alternate and supplementary positions are designated by the Davy Crockett section leader. Teams move to alternate positions when hostile fire threatens primary positions; supplementary positions are occupied as necessary.

35. Retrograde

a. General. The Davy Crockett section is employed in retrograde operations applying techniques similar to those used in the defense.

b. Retirement. The Davy Crockett section will move as part of its parent organization when it participates in a retirement. Davy Crockett teams are interspersed in the column to facilitate rapid deployment into firing positions and to provide fire support to all elements of the battalion.

c. Withdrawal. The Davy Crockett section provides fire support for its parent battalion throughout all phases of the withdrawal. As the main body withdraws, one or more Davy Crockett teams are attached to the security elements. The remainder of the section withdraws under control of the section leader or commander of unit to which attached. Security measures must be taken to prevent weapons left with the security elements from falling into enemy hands.

d. Delaying Action. Davy Crockett fires are highly effective in support of delaying actions. Teams are usually placed in direct support of subordinate units because of the relatively wide

frontages incident to delaying actions. Fires are planned to subject the enemy to attack at maximum ranges and targets of opportunity

are engaged as they are detected. Use of air observers permits full use of the range characteristics of the system.

Section V. ARMORED CAVALRY OPERATIONS

36. General

The basic principles set forth in previous sections are applicable to Davy Crockett sections and the 4.2-inch mortars of the support squads found in armored cavalry units. This section prescribes techniques peculiar to armored cavalry operations.

37. Davy Crockett

a. General. The Davy Crockett teams are normally placed in direct support of troops of the squadron because of the extended distances in armored cavalry operations; however, they may be employed in general support when the required fire support can be provided by this method.

b. Support of Different Operations. Paragraphs 31 through 35, this appendix, are applicable to the Davy Crockett section in support of economy of force offensive, defensive, and retrograde operations by an armored cavalry squadron.

c. Reconnaissance Operations. Davy Crockett weapons are used in reconnaissance operations when fires from artillery, mortars, and tank guns are not sufficient. When firepower of the magnitude inherent in Davy Crockett weapons is required in the accomplishment of the squadron or troop missions, fires are delivered employing techniques described for the engagement of targets of opportunity (pars. 33 and 35, this app.).

d. Security Operations.

- (1) The Davy Crockett section supports its parent squadron in the conduct of security operations by applying the principles and techniques prescribed in paragraphs 31 through 35, this appendix, and in FM 23-20.
- (2) Davy Crockett teams will usually be placed in direct support of armored cavalry troops. Fires are planned to support defense of blocking positions and limited offensive action of the

security forces. Targets of opportunity are engaged as they are detected to prevent the enemy from reaching positions so close to friendly elements that troop safety considerations preclude firing of concentrations. Air observers should be used to extend observation out of ranges commensurate with those of the weapons system.

38. Support Squad (4.2-Inch Mortar), Offense, Defense, and Retrograde

a. Offense General.

- (1) This support squad, armored cavalry platoon, can be employed in two basic ways—
 - (a) Normally in support of the parent platoon.
 - (b) Infrequently, as a provisional platoon.
- (2) When employed as a provisional platoon it is under control of the troop commander and supports the entire troop.
- (3) Regardless of the method used, the squad must strive for maximum speed and accuracy during operation and movement and it must be constantly ready to provide fire support.

b. General Support of the Parent Platoon.

- (1) The platoon leader will control the support squad by designating its initial position or its place in formation, target areas, and displacement instructions in his operation order. After the operation begins he will control the squad by radio. The squad leader must monitor the platoon net constantly to stay abreast of the situation. From these situation reports he must be able to anticipate the fire requests he will receive and position his squad to support the platoon. This will relieve the platoon leader of constant supervision of the squad, but

the squad does not fire a mission without the knowledge of the platoon leader. This squad leader must keep the platoon leader informed of the squad situation: that is, position, displacement requirements, ammunition status, POL requirement, and ability to support the platoon.

- (2) The two primary techniques of selection of firing position and displacement are as follows:

- (a) In a fast-moving situation, when the enemy resistance is light, the support squad will move at the rear of the platoon formation. It must be far enough to the rear of the formation so that the minimum range of the weapon will not create a problem when it moves into firing position.
 - (b) When the enemy situation is such that the squad will be in position to fire, selection of the position will follow the characteristics outlined in paragraph 20, this appendix. In selecting these firing positions and in planning for displacement, consideration should be given to keeping the squad positioned so that the majority of fire missions will not be beyond the midrange of the mortar.
- (3) The support squad does not have the capability of providing for its own local security and firing in support of the platoon. Security is gained as follows:
 - (a) The area the squad is to occupy will have been cleared of the enemy by leading elements of the platoon as it advances.
 - (b) When the platoon is the advance guard for the troop, security is gained from the following elements of the troop as well as (a) above.

c. Provisional Platoon.

- (1) *General.* When the area of operations for the armored cavalry troop is such that the support squads can be brought together into a provisional platoon, they will follow the tactics and techniques outlined in FM 23-92.

- (2) *Control.* Although the troop commander will control the provisional platoon, a control headquarters is provided in the platoon. Following are techniques that may be employed:

- (a) One of the armored cavalry platoon leaders is designated as platoon leader. He uses one of the squad leaders as platoon sergeant, one as computer, and the third as gunnery sergeant.
 - (b) The senior, or best qualified, squad leader is designated to command the platoon. He uses one squad leader as computer and the other as gunnery sergeant.
- (3) *Observation.* The forward observers will normally be the scouts and other individuals in the troop who can observe suitable targets.
 - (4) *Communication.* Radio is the primary means of communication. The provisional platoon is on the troop command net for fire control.

d. *Defense and Retrograde General.* During defensive and retrograde operations, the support squad is employed in a manner similar to offensive operations. The squad is in general support of its parent platoon or is formed into a provisional platoon under troop control, along with the support squads from the other platoons. The factors of METT determine which method best accomplishes the fire support mission.

e. Defense.

- (1) *General support of parent platoon.* When the squad is employed in general support of its parent platoon, it occupies a firing position as close to its platoon as minimum range and the enemy situation permit. Concentrations are planned to cover the known and suspected areas, and a barrage is planned for an area that cannot be covered by flat-trajectory fire. The firing position—
 - (a) Must provide maximum coverage of the front and flanks of the platoon position.
 - (b) Should be in defilade and allow for mask and overhead clearance.

(c) Should have good routes of supply.

Note. Alternate and supplemental positions should be prepared.

(2) *Support squad as part of provisional platoon.* The troop commander employs the support squads as a provisional platoon when the situation permits, applying the tactics and techniques outlined in FM 23-92.

f. Delaying Actions. In a delaying action, the support squad is employed using the techniques outlined in paragraph 25, this appendix. Firing positions selected should—

- (1) Provide for taking the enemy under fire at maximum range.
- (2) Have a good route of withdrawal for rapid displacement to the rear.
- (3) Be in rear of the squad's parent platoon.

Section VI. MECHANIZED INFANTRY WEAPONS

39. General

Armor operations envisage the employment of combined arms forces at brigade, task force, and team level. Tank commanders at the task force and team level can expect the attachment of mechanized infantry. Thus, the tank battalion commander and the tank company commander must have a general understanding and appreciation of the organic fire support weapons of the mechanized infantry battalion and company. The primary fire support weapons organic to the mechanized infantry battalion are found in the mortar and Davy Crockett platoon and the antitank platoon. At company level, the 81-mm mortars and the 106-recoilless rifle of the antitank section are the primary fire support means.

40. Antitank Platoon

a. The primary mission of the platoon is to provide antitank support for the battalion. Its secondary mission is to provide fire support for the rifle companies of the battalion.

b. The platoon is capable of providing antitank support and fire support for the battalion in several tactical roles. Depending on the operation plan, the platoon may be employed in a general support, direct support, or attached role. The platoon's mobility and communication enable it or elements of it to respond rapidly to tank threats throughout the battalion area.

c. The platoon's primary target is enemy armor. It may engage bunkers, observation posts, vehicles, crew-served weapons, grouped enemy personnel, and other similar targets, provided this does not interfere with its anti-

tank role. The antitank platoon is the commander's primary organic antitank means.

- d.* (1) In the attack antitank weapons may be employed well forward or in depth to add to the battalion antitank capability. The battalion commander considers the factors of METT in determining where and how the weapons will be employed. He may attach 1 or more squads to 1 or more units and retain the remainder of the platoon in general support or he may hold the entire platoon in general support to be available for use where armor threats develop.
- (2) In movements to contact or when the enemy situation is vague, the commander retains the major part of the platoon in general support for flexibility in employment.
- (3) Security elements, such as flank or rear guards or screening forces, may have one or more squads attached.

e. In the defense and retrograde, squads of the antitank platoon are located generally where they can destroy enemy armor forward of the battle area and provide antitank defense in depth. When practicable, squads are mutually supporting. When antitank weapons are employed in the area of a forward rifle company to cover a tank approach of primary concern to that company, they are usually attached. The employment of other antitank weapons is integrated to provide the best possible antitank defense.

f. For detailed organization and employment of the antitank platoon, see appendix II, FM 7-20.

41. The Battalion Mortar and Davy Crockett Platoon

See sections II, III, and IV, this appendix.

42. The Weapons Platoon, Mechanized Rifle Company

a. *Offense.*

- (1) The company commander employs the 81-mm mortar section in general support whenever centralized control will permit delivery of fires in support of all or the major part of the company throughout the zone or along the axis of advance. Forward observers of the weapons platoon are positioned as directed by the company commanders.
- (2) He employs the antitank section in general support whenever centralized control will permit the squads to provide antitank protection for the company or, if appropriate, close fire support for the attacking platoons. Considerations in determining the method of employment include the company commander's ability to control the section throughout the attack and the section's ability to move rapidly throughout the area of operations to meet an armor threat.
- (3) For detailed discussion of the employment of the weapons platoon in the offense, see FM 7-11 and appendix III, FM 7-20.

b. *Defense.*

(1) *81-mm mortar section.*

- (a) Whenever possible, the 81-mm mortars are employed in general support. It is desirable that they be able to support all forward rifle platoons from one position area. Exceptionally, the forward rifle platoons may be too widely separated for the mortars to be used in general support. In this case, one or more squads may be attached to forward platoons while the rest are used in general support.
- (b) When the company is responsible for the combat outpost, the mortars may frequently be positioned

well forward initially, a short distance back of the FEBA, to provide adequate support for the combat outpost. If this does not give adequate support, one or more squads may be attached to the combat outpost.

- (c) When the mortars are employed in general support, the company commander designates a general position area for them, based on the recommendation of the weapons platoon leader.

(2) *Antitank section.*

- (a) Whenever possible, the antitank section is employed in general support for flexibility in moving the weapons throughout the company area to meet armor threats. When the terrain does not permit free movement, one or both squads may be attached to rifle elements.
- (b) One or both squads may be attached to the combat outpost.
- (c) When the antitank section is employed in general support, the company commander assigns each squad a general position area and a principal direction of fire, based on the recommendation of the weapons platoon leader.
- (d) For a detailed discussion of employment of the weapons platoon in defense, including selection of positions, see FM 7-11.

c. *Retrograde.*

- (1) *81-mm mortar section.* The 81-mm mortars are normally employed in general support to cover the front and are placed well forward to obtain maximum range. If the mortars cannot cover the company sector adequately from a centralized location, they may be attached to the rifle platoons. One or more of the mortars may be employed as a part of units left in contact.
- (2) *Antitank section.* The antitank squads are normally attached to the rifle platoon in whose area they are lo-

cated. If attached to units left in contact, they withdraw based on the plans of the rifle platoon.

(3) *General.* For a detailed discussion of the weapons platoon in retrograde operations, see FM 7-11.

Section VII. FIRE PLANNING AT PLATOON AND COMPANY LEVEL

43. General

The planning of organic and supporting fires to support an operation is accomplished at all levels. The plan of fire support at company, battalion, and brigade must be coordinated and fully integrated to insure success of the plan of attack or defense. The plan of fire support includes fires of organic, attached, and supporting weapons. Fire planning at platoon and company level must be continuous and as detailed as time will permit.

44. Fire Planning in Defense

a. Company Level. As soon as the battalion commander has determined his plan of defense, he assigns each company a sector of responsibility, which the company commander is required to cover by fire. The battalion commander will designate critical target areas to the companies. He may also assign a mortar barrage to the company. The company commander assigns areas of responsibility to each platoon. Upon receipt of the platoon plan of fire support, he integrates these plans along with the target areas, concentrations, barrages, and other organic and supporting fires available, selected and assigned in formulating his plan of fire support. The artillery forward observer and the mortar observer supporting the company are the commander's principal advisers in the preparation of the company plan of fire support. When the consolidated company plan of fire has been completed, the platoon leaders annotate their maps to reflect all planned fires. The targets and target areas are identified by numbers and letters so that any member of the company can call for fires on a target using a common identification system.

b. Platoon Level. The company commander assigns each platoon a sector of responsibility and specific targets or target areas. The platoon leader assigns a sector of responsibility to each tank along with specific targets or

target areas. The sectors of responsibility assigned each tank must be overlapping to insure complete coverage of the platoon sector. Tank commanders prepare a range card, which includes the specific targets and areas assigned by the platoon leader, and select additional targets to insure complete coverage by fire of the tank sector of responsibility. The platoon leader selects suspect target and target areas in addition to those assigned by the company commander. The fire plan submitted by the platoon leader to the company commander is an integration of the tank range cards, the targets assigned by the company commander, and targets selected by the platoon leader.

45. Fire Planning in Offense

a. Company Level. The company commander, assisted by the artillery forward observer, develops a plan of supporting fires to support the company's scheme of maneuver. In developing this plan, the company commander must consider—

- (1) The mission and scheme of maneuver.
- (2) Information of the enemy.
- (3) Possible enemy avenues of approach.
- (4) Fires requested by the platoon leaders.
- (5) Protective fires required along the flanks and during consolidation on the objective.
- (6) Smoke required to facilitate maneuver.
- (7) Illumination required to support a night attack.
- (8) Other supporting fires available such as attached mortars, artillery, close air support, or naval gunfire.

The company commander, platoon leaders, and artillery forward observers must be alert to detect targets of opportunity during the conduct of the battle, and request fires on these targets to prevent interference by the enemy.

b. Platoon Level. Upon receipt of the attack order, the platoon leader issues a warning order and begins planning for the employment of his

platoon. He is concerned primarily with fires on known or suspected targets and fires en route to and on the objective. The company commander will designate target areas and the

platoon leader should select targets and report these to the company commander or forward observers for integration into the company fire plan.

APPENDIX XV

NIGHT COMBAT TECHNIQUES

1. General

This appendix is a guide for commanders and staffs at all echelons for the employment of night combat techniques. Basically, night operations are conducted in the same manner as daylight operations. However, in night operations the problems of identification, control, and coordination are greater; dispersion is less; and movement is slower. The following paragraphs discuss the techniques that may be employed in night operations to overcome those problems.

2. Identification

Night identification procedures are based on the use of night vision equipment and visual, audio and electronic identification means. Audio identification measures are prescribed in FM 21-75.

3. Personnel Identification

Individuals may be identified through the use of challenge and password, as discussed in FM 21-75, and by the use of visual identification. Personnel should wear identification of some type in night operations. Luminous or reflective strips on the rear of helmets may be used to designate officers and noncommissioned officers. Luminous or reflective armband may be used to identify guides. At platoon level this may be done by using filtered flashlights, metascope, sniperscopes, infrared (IR) driving lights, and IR periscopes or telescopes. Other members of the unit may place a white band on either arm or both arms, on their packs, or on the rear part of their web belts. Standardized outer uniforms are also helpful.

4. Unit and Vehicle Identification

Units may be identified at night through radio communication used in conjunction with

audio or visual signals. Preplanned IR, radar, or other electronic signals may be used to identify units. Luminous panels or markers may be displayed on vehicles according to a preplanned procedure. Visible or nonvisible lights may be flashed according to a prearranged pattern as identification. Positive identification should normally be insured by dismounting a representative of the unit or vehicle and requiring him to identify all elements of the unit being identified. It is extremely important that adequate security is posted to prevent enemy infiltration.

5. Control

Since control of a unit during operations under conditions of limited visibility is difficult, techniques to aid in controlling the unit must be developed (pars. 6-10, this app.). Before adopting control techniques, the commander must consider the enemy's night vision capabilities and the effect these may have on his plans.

6. Formation

Control is facilitated by proper use of formations. By retaining the column formation as long as possible, control of movement is aided. Individuals and units will move with minimum dispersion, relying on darkness for cover and position to each other for maintenance of direction and unity. Control is aided further by designating guide vehicles and units responsible for rate and direction of movement.

7. Preparation

a. General. Control over a unit is facilitated by adequate prior training in the use of night vision equipment. Commanders insure familiarity of all personnel with the plan, and insure maximum reconnaissance by leaders down to

tank or squad level. Detailed orders, simple plans, and adequate SOP's are also vital in facilitating control.

b. Attack. In the attack, easily identifiable objectives, well-defined boundaries, LD's, and other control measures must be selected. IR equipment, radar, and guides may be used to assist in the movement of individuals and vehicles. Illumination means may be used to mark boundaries.

c. Defense and Retrograde. In defensive and retrograde situations, range cards are prepared for use during limited visibility or at night. The preparation of range cards is explained in FM 17-12. Commanders through company level will actively supervise and insure their proper and accurate preparation. At platoon level they will be consolidated into sketch form as a supplement to the platoon fire plan. The platoon fire plan submitted to company should include data from this sketch range card, location of platoon observation posts and listening posts, and location of platoon surveillance equipment with their fields of survey. At

company level these sketches are consolidated into the company fire/surveillance plan for submission to battalion. Examples of a tank range card, platoon fire plan, and company fire plan are shown in figures 65 through 67. The company surveillance plan may be consolidated with or attached to the fire plan. Details included in these plans will include as a minimum the primary position and sector of fire for crew-served weapons and tanks and the primary position and area of surveillance coverage for surveillance means. Units given a support by fire mission for a night attack may use range card techniques for employing fires. For information regarding surveillance cards and plans, see appendix XXII.

d. Supporting Fires. Control of supporting weapons and their fires, when illumination is used, is identical to that in daylight operations. When no illumination or partial illumination is employed, the movement of weapons and shifting of fires must be restricted. Protective fires for flanks of units and to isolate the objective in the attack must be planned. Once

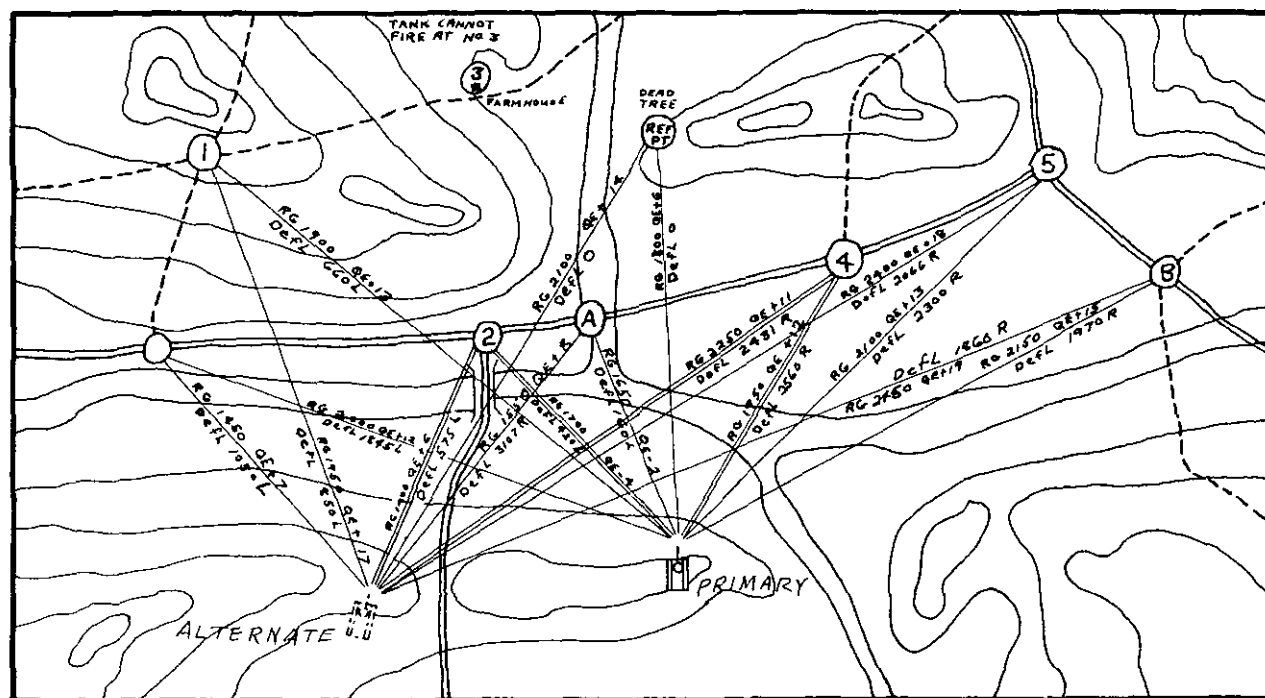
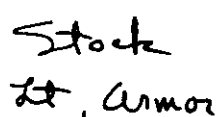


Figure 65. Sketch range card.



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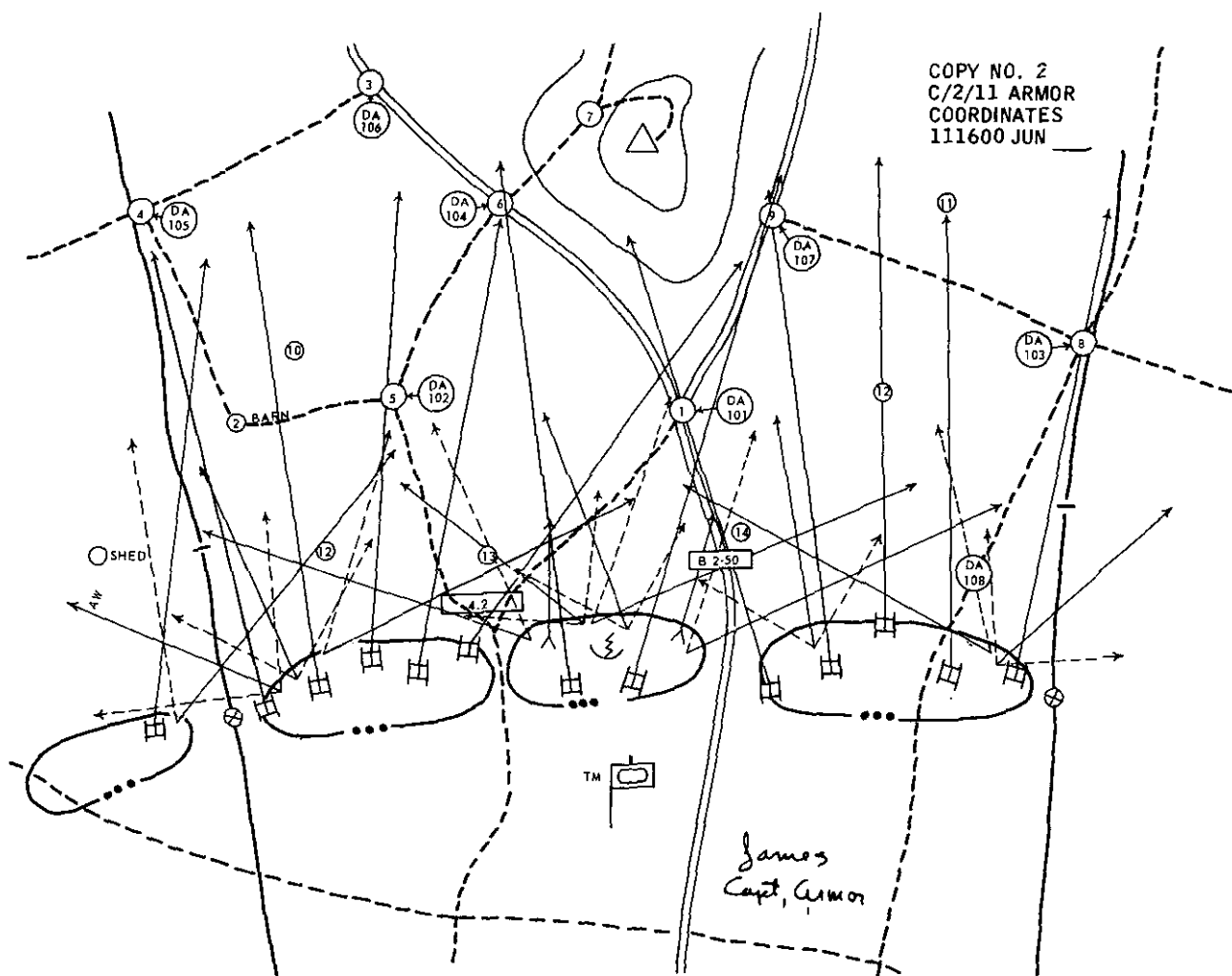


Figure 67. Company/team fire plan.

illumination is provided, restrictions on supporting fires may be removed.

e. Communication. Communication is vital in controlling night operations. The use of preplanned alternate and multiple means of communication is necessary. Once the attack is discovered, radio becomes the principal means of communication.

8. Battlefield Illumination

This is an active illumination system that uses visible light from a manmade source for illumination. The efficiency of this system is greatly reduced by fog, haze, rain, and snow.

Examples of battlefield illumination are ground signals, illuminating grenades, trip flares, artillery, mortar- and rocket-delivered illuminating flares, air vehicle-delivered flares, searchlights, and improvised means. The observer needs no encumbering equipment to use the system.

9. Near IR

Near IR is an active illumination system that uses nonvisible, IR radiations from a manmade source. The illumination results from a visible light that is filtered to permit the passage of only IR radiations.

10. Employment of Active Illumination Systems

a. General. Active systems in operation can be detected by the enemy; therefore, active systems are controlled and coordinated closely by the commander directing the operation.

b. Planning. In addition to normal planning for combat operations, commanders must—

- (1) Prepare an illumination plan and insure its integration into the plan of fire support if artillery or mortar illumination means are employed.
- (2) Prepare a surveillance plan for the employment of visual and audio devices and techniques.
- (3) Consider the use of all appropriate night vision equipment in the illumination and surveillance plans and, consistent with other tactical considerations, insure that the most efficient use is made of their capabilities.
- (4) Insure the provision of an adequate communication network.
- (5) Consider the observation that may be caused by the effects of supporting fires since dust may diffuse illumination and act to the disadvantage of friendly forces.
- (6) Control of active illumination means will be vested in the commander having overall control of the operation.

c. Indirect Illumination. Indirect illumination may be obtained through diffusion or reflection. In this technique, the light source is a searchlight positioned behind a terrain mask with the light reflected from low clouds or diffused over the crest of the mask. The location of the light source is difficult to detect and, therefore, the position need not be changed frequently. Tank searchlights will be used rarely for indirect illumination as it limits the use of the tank weapons. The primary source of indirect illumination is the artillery searchlight.

d. Direct Illumination. In planning for the use of direct illumination, the commander should insure that the illumination means illuminates the enemy position or formation, so that effective fire may be placed on him, while the friendly force remains unilluminated. Techniques to be used in direct illumination are

dependent upon the characteristics of the area to be illuminated, atmospheric conditions, illumination means available, and tactical situation.

- (1) *Pyrotechnics.* The employment of pyrotechnics, in addition to the considerations affecting all illumination systems, is based on a further consideration of—

- (a) Range of weapon or air vehicle.
- (b) Duration and area of effective light.
- (c) Temporary loss of supporting fires during illumination firing.

- (2) *Searchlights.* Searchlights used in direct illumination give more intense illumination on a target area than when used indirectly (fig. 68). The intensity of illumination on the ground decreases gradually as the range from the searchlight increases. Minute atmospheric particles reflect the beam and reduce the ability of the observer to see the target area. This effect may be reduced by positioning the observer to the flank of the light. Objects silhouetted between an observer and the light beam are clearly visible to a range of several hundred meters. The efficiency of direct illumination is affected by atmospheric conditions, natural night light, the reflectivity of the illuminated surfaces, and shadows. Searchlights used in direct illumination should be operated intermittently and moved to alternate or supplementary positions often. The tank-mounted searchlight is the searchlight most commonly available to armor commanders. A detailed discussion of the employment of tank-mounted searchlights is discussed in paragraphs 15 through 17, this appendix.

11. Passive Night Vision

Passive night vision systems are used for surveillance. Passive measures used to survey the battlefield are dependent upon the amplification of natural night light or IR radiations. The use of passive equipment should be considered by each commander in planning fields

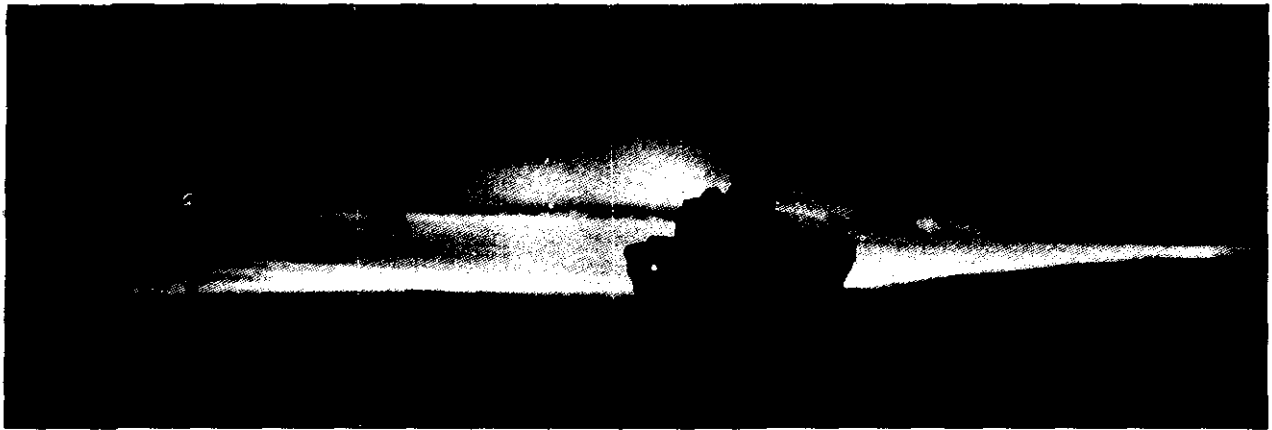


Figure 68. Direct illumination.

of fire, the operation plan, and the surveillance plan. Passive night vision equipment is ideally suited to operations requiring stealth and secrecy. Authority to use passive night vision equipment is generally given with its issuance to the unit. Normal observation techniques are followed, with appropriate changes, in the use of passive night vision equipment.

12. Low Light Level Image Intensification (LLLII)

This system uses natural light from the night sky reflected by the target. It produces a useful visible image in a viewing scope that is essentially the same as a near IR viewing scope. Fog, haze, rain, and snow reduce the effectiveness of the system.

13. Far IR

This night vision system uses a scope that receives and amplifies far IR radiations from a target and presents an image of this target. Far IR radiations are produced by objects that generate heat, such as internal combustion engines or the human body. Since most military targets emit more heat than their natural surroundings, they can be detected with far IR equipment even though camouflaged. This equipment is affected less by fog, haze, rain, and snow than near IR or LLLII night vision equipment.

14. Employment of Passive Night Vision Systems

a. Individual Use. Passive night vision equipment will be used at the same level as

individual and crew-served weapons. This equipment may be used in conjunction with individual and crew-served weapons or only for surveillance.

b. Unit Use. Passive night vision systems should be integrated into surveillance, security, and fire plans. Passive and active night vision measures are effectively used in a complementary role; however, both systems are capable of independent use. The initial search of the area being observed is made with passive night vision equipment. Upon detection of a suspected target active night vision equipment (if authorized) may be employed to identify positively the suspected target. An example would be the passive use of a metascope or IR binoculars to survey an area for active illumination. Upon detecting IR emissions, active visible or nonvisible illumination could be used to identify the suspected target and to place fire on it. The control of active illumination equipment is vested in the commander having direct control of the operation.

15. Searchlights

The employment of tank-mounted searchlights is based on certain techniques of positioning lights, combining lights, and turning on lights. Lights must be controlled and their effect on the enemy must be considered. For fire commands used to control searchlights and for techniques of target engagements see FM 17-12.

a. *Single or Intersecting Beams.* A single beam or an intersection of two or more beams may be used to—

- (1) Assist in marking targets or objectives (fig. 69).
- (2) Aid in deception.
- (3) Orient air vehicles and illuminate landing areas.

b. *Flicker Illumination.* Tank-mounted searchlights should be operated in groups of two or more when using flicker illumination techniques. The duration of each flicker should be approximately 15 seconds. During the period one tank searchlight is flicked off, other searchlights should be flicked on in turn.

c. *Positions.* The tactical employment of tank-mounted searchlights is facilitated by daylight reconnaissance and selection of positions. The reconnaissance should include azimuths and elevations to prominent points and target areas. Positions should be located as accurately as time and facilities permit. Final selection of positions should consider the location of vital

friendly installations that could be damaged by enemy action directed at the searchlight. The position should use maximum defilade compatible with the direct illumination mission. Ideally, the position should be on high ground to afford maximum range and flexibility and to avoid silhouetting friendly troops located along or near the axis of the beam.

d. *Control of Searchlights.* The unit commander may control searchlights to be used for a specific operation under one commander or he may employ them as part of their parent unit and control their illumination through normal command channel, depending on which method best contributes to the accomplishment of the mission.

e. *Effects on Enemy Observers.* In using the searchlight for direct illumination, the following effects on enemy observers should be considered:

- (1) When an observer is close to the searchlight, direct observation into

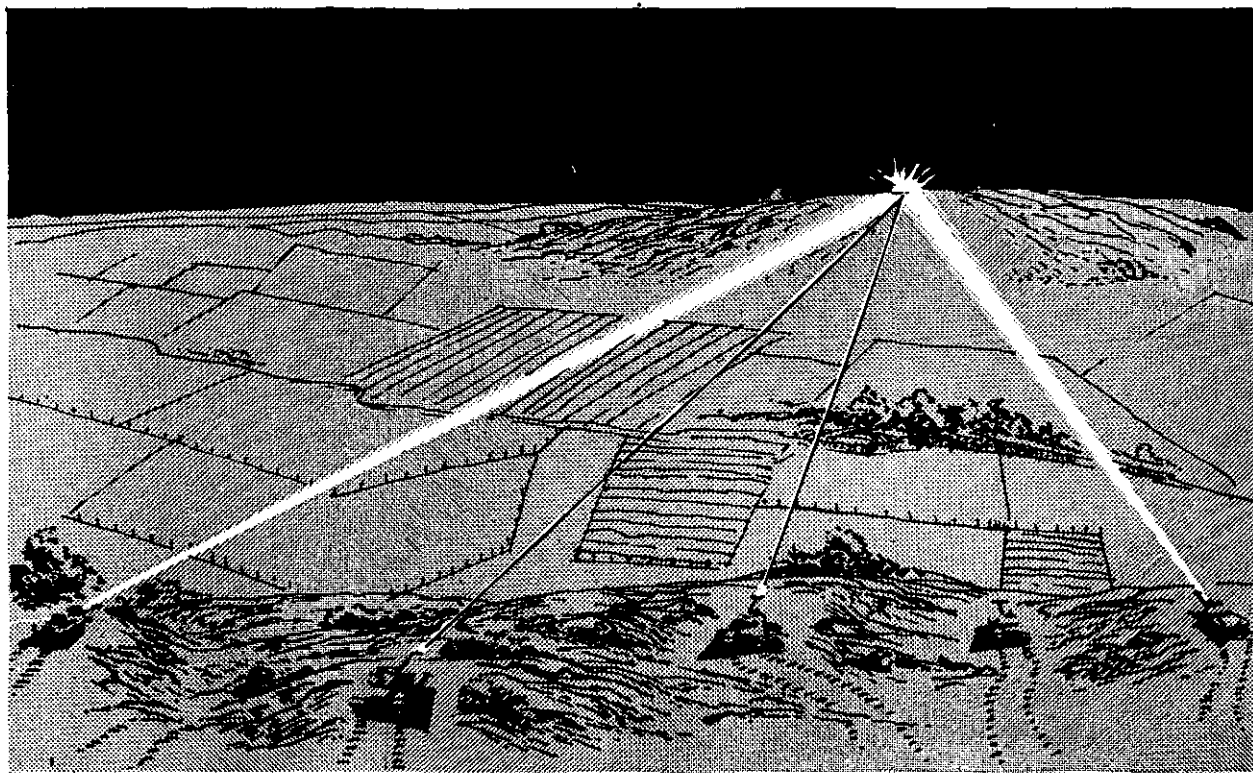


Figure 69. Intersecting searchlight beams marking a target.

the light source may cause temporary night blindness.

- (2) An observer located in the light beam will find it difficult to estimate the range to the searchlight.
- (3) Objects silhouetted between an observer and the light beam are visible for several hundred meters.

16. Tank-Mounted Searchlights in the Offense

a. Direct Illumination. In using tank-mounted searchlights for direct illumination, the following principles are considered:

- (1) Vehicles or troops advancing toward an enemy position should remain along the outside edge of the searchlight beam, to use the stray light along the edge of the beam and still advance undetected.
- (2) Assuming that the enemy position is known, a moving tank unit may re-

duce the probability of detection by the following use of searchlights:

- (a) If the enemy observer is some distance (1,500 meters) from the friendly light source, position the light so that the observer is generally in the center of the beam; the friendly approaching elements should then remain on either side, *outside* the beam's edge.
- (b) If the enemy observer is relatively close to the friendly light source (700 meters) then position the light beam so that he must look through or across it. The friendly approaching element should remain beyond the far edge of the beam, *away* from the enemy (fig. 70).
- (3) It is difficult to maintain searchlights on targets while searchlight tanks are moving over rough terrain. At the same time, tank-mounted searchlights accompanying a maneuvering force may disclose the direction of attack

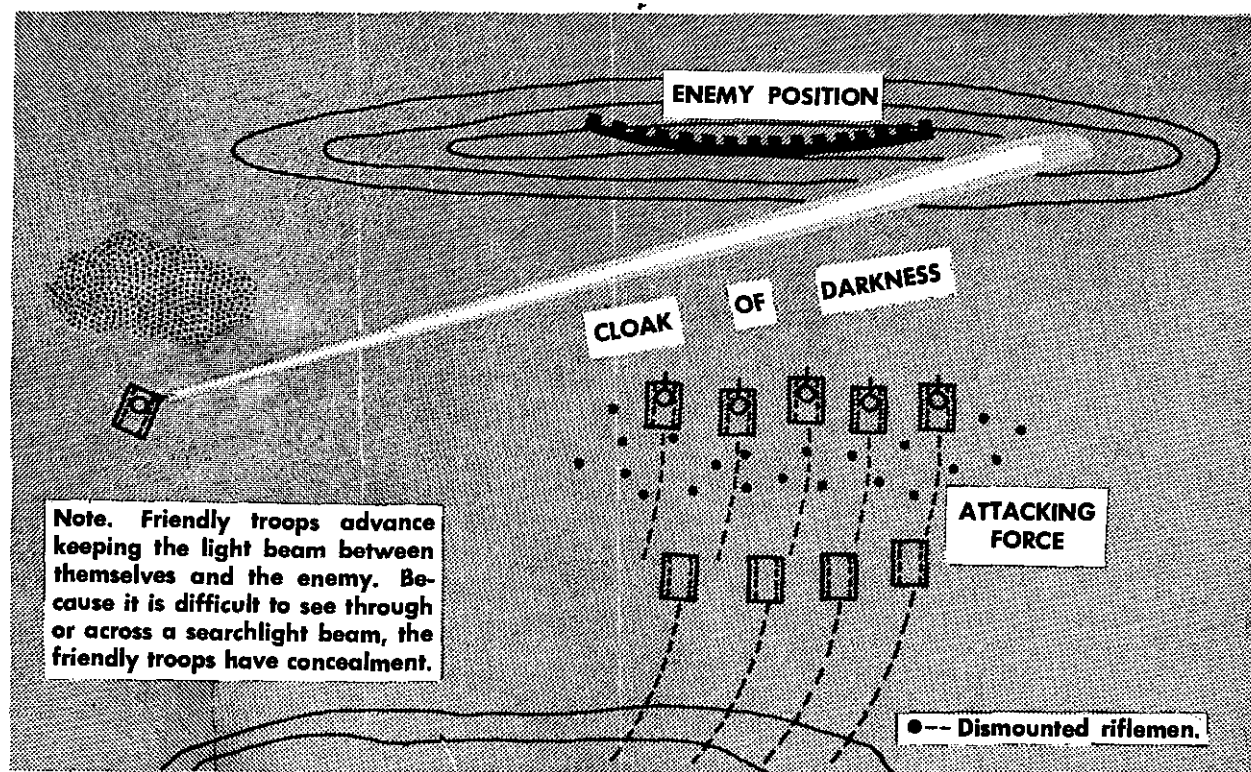


Figure 70. The cloak of darkness behind the searchlight beam.

if searchlights are left on continuously. Therefore, whenever the terrain and enemy situation permit, searchlight tanks should advance by bounds. Illumination should be accomplished while tanks are stationary; searchlights should be extinguished when tanks are moving.

b. Employment in the Offense. Tank-mounted searchlights are best employed in the following offensive roles:

- (1) In the initiation and the continuation of an exploitation.
- (2) In a night attack against a hastily organized position.
- (3) In a night penetration, as part of the assault wave, to conceal the movement of accompanying tanks and infantry in the cloak of darkness between the light beam and the objective.
- (4) In a night envelopment, as part of the base of fire, to illuminate the objective.
- (5) In orientation of friendly troops. This

can be accomplished by illuminating a part of the objective, terrain features leading to the objective, or terrain features between the line of departure and the objective. The light beam itself may be used as a guideline, boundary, or line of departure. (Friendly troops should avoid moving in the brightest part of the beam, but should skirt the edge of the beam to obtain maximum concealment.)

c. Methods of Employment. Tank-mounted searchlights can be employed in any of the three following methods of attack:

- (1) *Tanks support by fire only.* When the terrain precludes the use of tanks in the maneuver force, they may be employed in the "support by fire only" method; the tanks will, whenever possible, be dispersed throughout the supporting position (fig. 71). This permits the best means of illuminating the target. The commander should be located to provide maximum

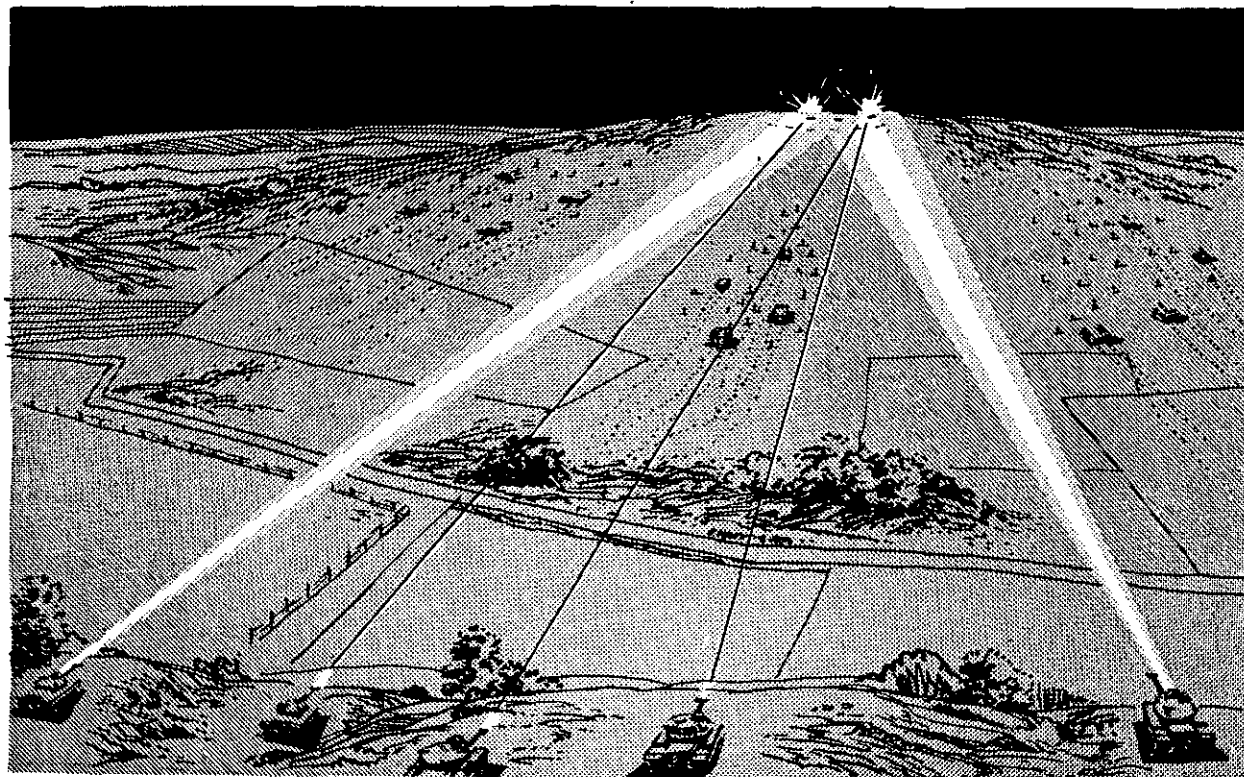


Figure 71. Use of tanks with searchlights in the "supporting by fire only" role.

control of the lights. Illumination should not take place until called for by the commander of the maneuvering forces, but it should be employed in sufficient time to allow friendly fires to neutralize enemy fires and obtain fire superiority before the assault on the objective. As the assault force moves onto the objective, the operators of the lights must carefully avoid silhouetting friendly assaulting elements. The maneuvering force commander and the searchlights commander must coordinate closely. Each searchlight should be laid as accurately as possible on its target area before illumination, so that when lighted it will achieve immediate maximum illumination and psychological effect without loss of surprise. Plans for reorganization on the objective must include plans for alternate means of illumination, shifting of lights, and illumination in event of

counterattack. Plans also should be made to illuminate the flanks of the new position to aid in covering avenues of approach and areas used by enemy counterattacking forces attempting to outflank the new positions. Care must be taken to avoid creating shadow areas favorable to enemy counterattacking forces.

(2) *Tanks and infantry on the same axis (fig. 72).*

When tank searchlights are employed as part of the maneuvering force, they should be positioned throughout the maneuvering force. They should be immediately responsive to the unit commander's command and will employ flicker illumination. Whenever possible, searchlight tanks will approach to within 800 meters or less of the objective before illuminating. Even though the enemy may expect an infantry attack from some other

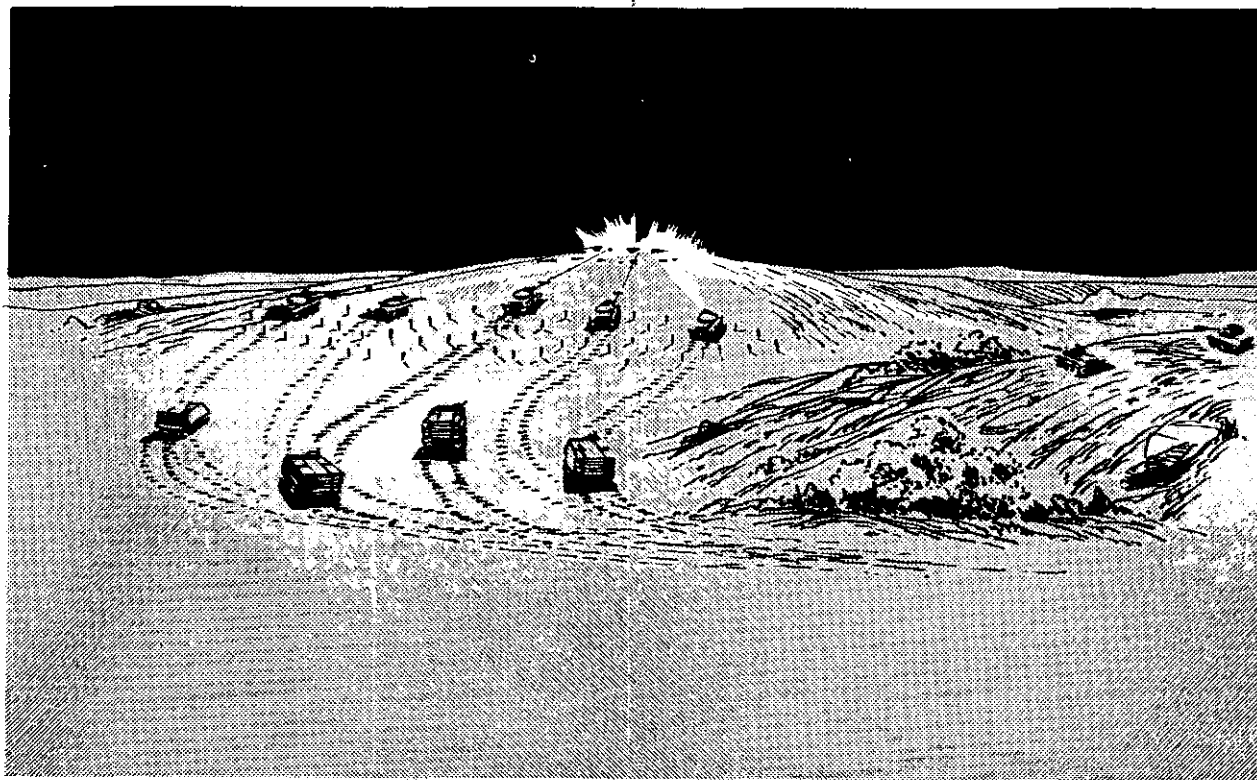


Figure 72. Use of searchlights when tanks and infantry are employed on the same axis.

direction than that of the attacking tanks, the blinding condition of the lights may effectively prevent enemy observation. Friendly infantry may attack from any direction outside the searchlight beam and still benefit from the darkness. The infantry must close rapidly with the enemy, securing the positions as quickly as possible, to reduce the illumination time. Normally, tank-mounted searchlights will maintain illumination until the objective is taken. Extinguishing of searchlights will cause night blindness unless an alternate light source is provided as in flicker illumination or by using artificial moonlight or parachute flares. Plans for reorganization of the position will include the order to extinguish or shift lights and provision for illumination in event of counter-attack by the enemy. Positions for searchlights on the objective must be reconnoitered and occupied rapidly.

- (3) *Use of tank searchlights for boundary illumination.* When tank searchlights are used to mark boundaries they are employed in pairs and use flicker illumination. They will move by bounds in the same direction as the attacking force and lay the searchlight beam on predetermined terrain features or on a given azimuth. The searchlights used should be obtained from an uncommitted force so as to not dissipate the combat power of the attacking forces.

17. Tank-Mounted Searchlights in Defense

a. General. The searchlight is used to cover likely avenues of approach and provide illumination for night counterattacks. Proper use of searchlights in coordination with listening posts provides an additional aid to surveillance and assists in gaining tactical surprise over approaching enemy troops. The reverse of the tactics for offense (par. 16) will apply when an enemy is using a searchlight in direct illumination on the offense. Friendly forces give special attention to the dimly illuminated area *outside* the edge of the enemy light beam. The

defender should try to silhouette an advancing enemy in the beam's light.

b. Planning. Preparation for the defense employing tank searchlights requires the same planning and coordination that precede any other defensive action. Planning will include these additional considerations:

- (1) Coordination of tank searchlights with other illumination means and the determination of which lights will provide fixed illumination and which will sweep areas with the light.
- (2) Position areas for tank-mounted searchlights.
- (3) Control measures to prevent premature illumination and disclosure of friendly positions.
- (4) Alternate means of communication for coordinating lights with infantry fires.

c. Employment.

- (1) Requirements for clear fields for illumination are similar to requirements of direct-fire weapons for clear lines of sight to the target area. The commander will select areas and assign priorities for illumination. Searchlights will be laid on selected areas to provide instantaneous illumination, either sweep or fixed, on order. Selected areas will be given code designations. Illumination will be requested by code designations, thus reducing the time required to put the lights in action. Illumination data will be incorporated into the range card for each tank in the defense area positions.
- (2) Lights will be turned on only—
 - (a) When searchlights will influence the action by providing illumination for aimed fires.
 - (b) When the enemy has accurately located the position, and darkness no longer provides security.
- (3) Searchlights may be extinguished when in imminent danger of being destroyed or extinguished by close-in small arms fire, or when the final protective fires have been penetrated by the enemy. In either case, the decision

to extinguish lights will normally remain with the commander of the defending unit.

- (4) Efforts will be made, by using deception and fires, to direct the enemy into areas where searchlights can be used to illuminate him and facilitate his destruction by aimed fire of infantry and tanks. By engaging the enemy at maximum effective range his attack may be retarded. Special attention should be given to fringe areas of fixed beams since the enemy, while avoiding direct illumination, may attempt to use the low-level illumination on the edge of the beam to facilitate his advance. The enemy, attempting to avoid illumination, may be canalized into selected areas best suited to defense by our forces or into ambushes or minefields.
- (5) Effective fire is best obtained by having one tank engage the target with its searchlight while another tank engages the target with the main gun or machinegun. The firing and illuminating roles will be exchanged frequently to decrease exposure of the illuminating tanks to counterfire.
- (6) Tank-mounted searchlights, as part of the illumination plan, are integrated into the coordinated fire plan to obtain maximum effectiveness of fires.
- (7) Steady illumination is to be avoided since it permits the enemy to adjust fires against the tank positions. The alternating periods of light and darkness obtained by flicker illumination serve to confuse the enemy.
- (8) Areas or points of illumination will be picked at the maximum range of the light, and guns and lights will be pre-laid on these target areas. When blocking positions are within 2,500 to 3,000 meters of each other, coordination will be established so that tank-mounted searchlights of one position can assist adjacent blocking positions in illuminating areas between posi-

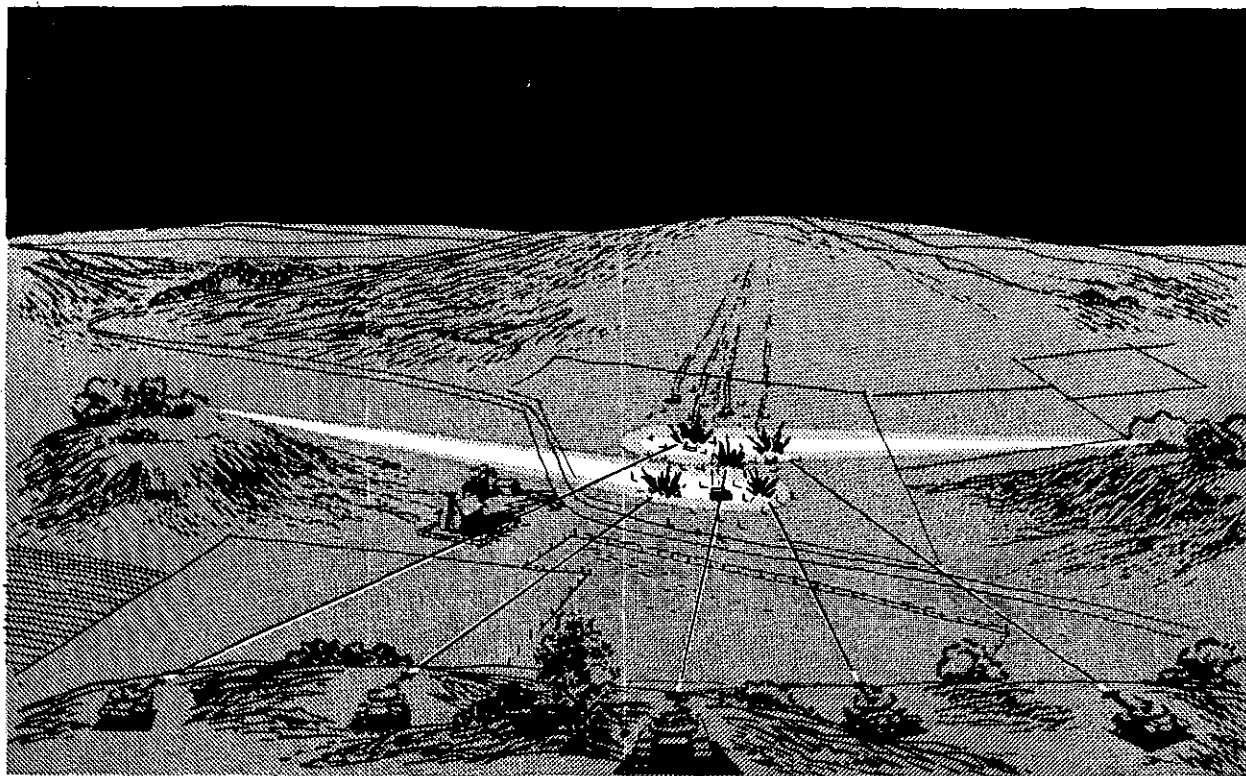


Figure 73. Tank searchlights illuminating area between blocking positions.

tions or the flank of an attacking force (fig. 73).

- (9) Until the entire defensive position is committed to action, the minimum number of lights necessary to accomplish the defense mission will be used to prevent disclosure of the size of the defensive force.
- (10) Flexibility in the defense is assisted by placing tank-mounted searchlights in position to support friendly counterattacking forces (fig. 74).

18. Night Techniques

Normal daylight occupation techniques are followed at night supplemented by additional control techniques. At night or during periods of limited visibility, the guide for subordinate units should be equipped with markers so that he can physically mark the location for each vehicle on the ground. Ideally, these markers should be luminous. The route to each vehicle location may be marked with white tape or other light reflective material. If tactical considerations permit, a unit may coil in the open before entering the area. While vehicles are

being fueled the commanders can complete a reconnaissance of the route into the area and the actual location for the vehicles. Vehicle locations may be adjusted by the commander during this reconnaissance. This period allows vehicle crews time to gain or regain night vision. Normal night security will be posted at all times.

19. Guide Signals

For signals used by guides at night, see FM 21-60.

20. Visible

The most effective countermeasure against visible illumination, other than destruction, is counterillumination. This nullifies the effectiveness of the initial illumination. Other measures are the use of smoke to diffuse the light, direct or indirect fires placed on the light source, and assault of the light source position by infiltration.

21. Nonvisible

Nonvisible illumination of the battlefield must be detected before effective countermeas-

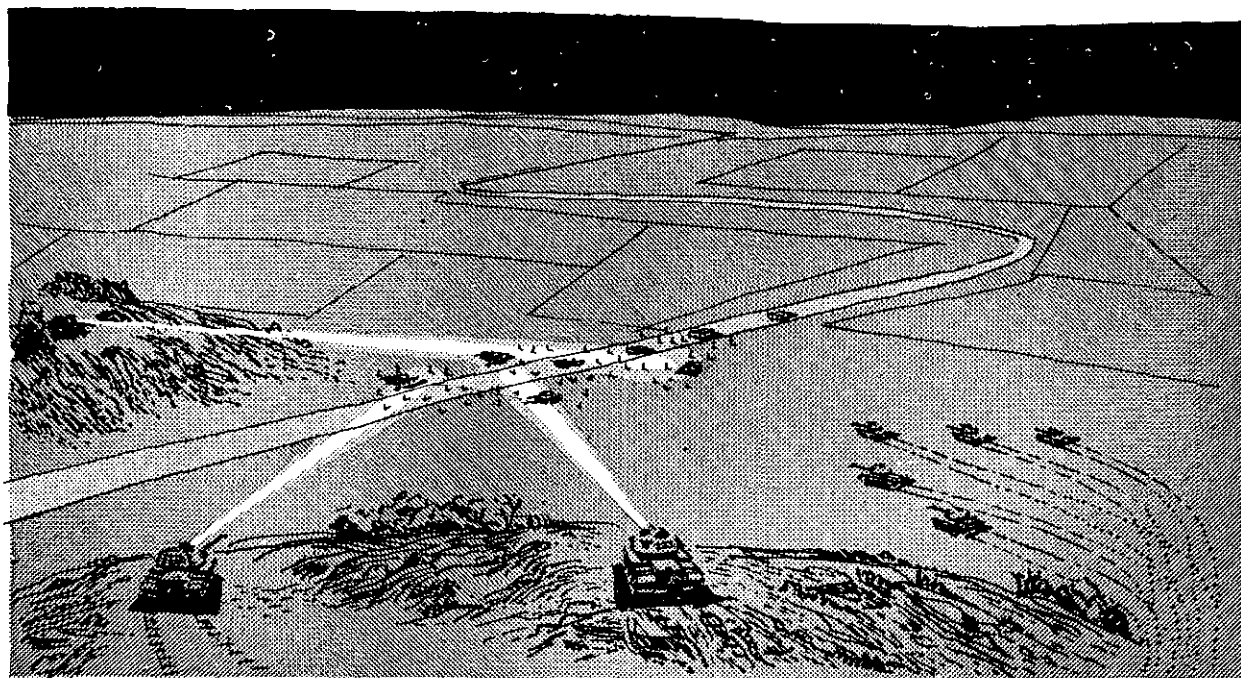


Figure 74. Tank searchlights supporting friendly forces in the counterattack.

ures may be taken. After the illumination device has been detected and the range to its location determined, four courses of action may be taken—

a. The device may be kept under observation for possible elimination later.

b. The device may be fired on by direct or indirect weapons.

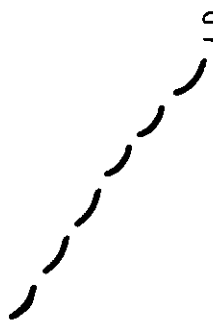
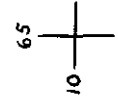
c. Counterillumination may be used.

d. Smoke may be used to diffuse the light.

23. Passive Systems

The use of passive surveillance systems may be countered by using the same techniques employed during daylight to prevent observation by the enemy except that sparse concealment is ineffective against far IR detectors. Movements or operations in the observed area may be restricted.

APPENDIX XVI
ILLUMINATION PLAN

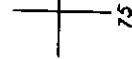
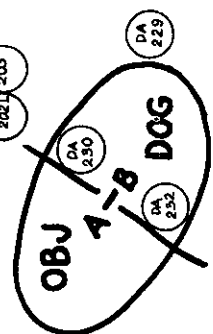


IS
PPOS

DA
200

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DA
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DA
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(Classification)

Copy No. 2
2d Inf Bn, 91st Inf (Mech) (TF 2/91)
GAUBUTTELRUNN (6399), GERMANY
071800 June 19

- Appendix 1 (Illumination Plan) to Annex A (Fire Support Plan) to OPORD 31.
Reference: Map, GERMANY, 1:25,000, GIEBELSTADT sheet.
1. TF 2/91 Inf will conduct a mounted, illuminated attack 080100 June 19 to seize designated objectives with two teams; Team A on the north and Team B on the south.
2. Illumination will begin and cease on task force order.
3. Execution of illumination plan will be controlled by Arty LO with TF 2/91 Inf.
4. Code word to call for illumination FIDDLE.
Code word to extinguish illumination. AGONY.

Table of Description				
Conc	Description	Coordinates	Altitude	Area
DA 200	Mechanized Co	69620310	280	680 m
DA 201L	Road Junction	68580190	300	155-mm H diamond, or 4.2 in diamond, on call.
DA 202L	Road Junction	68500120	294	SLT, 1/2, Diffused, H-hour.
DA 203	Entrenchment	68840110	300	SLT, 1/2, Diffused, H-hour.
DA 20F	1 June	6709	77	SLT, 1/4, Direct or 4.2 in diamond, on call.
L8	Area 1	0102770	300	155-mm H diamond.
DA 229	Road Junction	69939872	291	SLT, 1/2, Diffused, or 4.2 in diamond, on call.
DA 230	Objective	67209924	300	SLT, 1/4, Direct, or 155-mm or 4.2 in diamond, on call.
DA 231	Road Junction	70500243	280	SLT, 1/2, Diffused, or 4.2 in diamond, on call.
DA 232	Road Junction	67019818	305	SLT, 1/2, Diffused, or 4.2 in diamond, on call.

Acknowledge.

Distribution: A
TF 2/92 Inf
2/22 Armd Cav
OFFICIAL:
/s/ Redlegs
REDLEGS
S3

Jones
Lt Col

(Classification)

Figure 75. Illumination plan.

APPENDIX XVII

TASK ORGANIZATION

1. General

Task organization is the cross attachment of units to implement the commander's concept of organization for combat. It is the determination of number and type of units to be placed temporarily under a single commander. In determining organization for combat in his estimate of the situation, the commander is concerned with the advantages and disadvantages of leading an attack with tank-heavy, infantry-heavy, balanced, or pure units. Once he has decided to lead with a tank-heavy unit, the task organization must be determined since "tank-heavy" may mean 3 tank and 1 infantry units, 3 tank and 2 infantry units, or 2 tank and 1 infantry unit. For examples of task organizations see FM 17-15 and FM 17-30.

2. Organization

Task organization is determined from an analysis of the factors of METT and the commander's decision. Although the factors of METT are discussed separately below, it must be remembered that they are interrelated in terms of the mission.

a. Decision. The task organization must satisfy the commander's needs as expressed in his decision on organization for combat.

b. Mission. The anticipated mission and tasks of the unit to be organized must be considered. The subordinate commander will be assigned sufficient combat power to accomplish his mission. A useful technique is to visualize the employment of elements in accomplishing the mission, which should allow a fair estimate of the number of elements required. For a discussion of mission as a factor affecting employment, see section II, chapter 2.

c. Enemy. The effectiveness of the enemy is based on his strength, composition, disposition, and location. An analysis of these conditions

assist in determining the number and type of forces to be assigned to a subordinate commander. For a discussion of the enemy as a factor affecting employment, see section II, chapter 2,

d. Terrain and Weather. Terrain and weather affect the combat power of units. An analysis of these factors is important in determining the type of forces to be assigned to a subordinate commander. For a discussion of the factors of terrain and weather, see section II, chapter 2.

e. Troops Available. The greatest limiting factor to task organization is the restriction imposed by the number, type, and combat effectiveness of units available. All aspects must be analyzed, including the number and type of units and their capabilities, their state of training, maintenance, status of supply, present locations and missions, recent activities, and contemplated future requirements. The personalities of commanders is also a consideration. For further discussion of troops available, see section II, chapter 2.

3. Source of Units

As a technique, task organization (including unit designations) will be stated in the operation order (app. VI). However, whenever possible, subordinate commanders should be asked to furnish the designation of their elements to be detached. For example, the battalion S3 determines that Company A will furnish one platoon to another company. The S3 should, if time permits, ask the commander of Company A which platoon he desires to detach. The commander of Company A will furnish the platoon best suited for the task.

4. Changes to Task Organization

Task organization, if changed during the conduct of operations, is more strongly in-

fluenced by time and space factors and current activities of the unit. Many actions may be initiated with a task organization that is less than ideal in the interest of timeliness and troops available.

5. Use of Battalion Headquarters

a. Situations can be expected to develop that will require one battalion to be attached to another battalion or all companies of a battalion to be attached to other battalions, leaving a control headquarters without subordinate elements. Either situation is undesirable and should be avoided if possible.

b. When a battalion is attached to another, the battalion attached becomes subordinate to the battalion to which attached. Missions for the battalion attached could include functioning as the reserve, functioning as one of several attacking elements, or assuming responsibility for a part of the sector of defense of the battalion to which attached.

c. Missions for a battalion headquarters without subordinate elements created as a result of brigades attaching all of the companies to other battalion task forces could include—

- (1) Use as an alternate brigade command post.
- (2) Use as a planning group for future operations, or for developing counter-attack plans in the defense.

- (3) Augmentation of the brigade staff to permit both staffs some rest.
- (4) Use as a control headquarters for rear area security operations and damaged control operations.

6. Use of Company Headquarters

a. Situations may arise requiring a company to be attached to another company or all platoons of a company attached to other companies leaving a control headquarters without subordinate elements. Either situation is undesirable and should be avoided if possible.

b. When it is necessary to attach a company to another, the company attached becomes subordinate to the company to which attached. Appropriate missions for the company headquarters in this status are to—

- (1) Assist in planning.
- (2) Supervise organic or attached fire support elements.
- (3) Supervise the logistical effort.

c. Missions appropriate for a company headquarters without subordinate elements created as a result of battalion task force's attaching all of the platoons to other companies may include—

- (1) To assist in planning or reconnaissance.
- (2) To assist the battalion staff in the technical aspects of the employment of the attached platoons.

APPENDIX XVIII

EMPLOYMENT OF THE ARMORED VEHICLE LAUNCHED BRIDGE (AVLB)

1. General

a. An armored vehicle launched bridge section is organic to each tank battalion except the airborne division tank battalion. Each section has two assault bridge launchers, each launcher mounting a 63-foot, class 60, assault bridge (fig. 76).

b. In addition, the assault bridge platoon of the bridge company, division engineer battalion, has two organic armored vehicle launched bridge sections. Each of these sections has two assault bridge launchers, each launcher mounting a 63-foot, class 60, assault bridge, and 1 heavy tractor-trailer that transports an

assembled spare assault bridge. These AVLB's provide assault bridging to the armored cavalry squadron, task forces built about the nucleus of the mechanized or infantry battalion, or supplement the assault bridging of the tank battalions.

2. Uses

The armored vehicle launched bridge (AVLB) is employed primarily in assault crossings, but because of its mobility and minimum constructing personnel requirements, it may be used effectively in other ways. It is particularly suitable for spanning streams, antitank ditches, craters, canals, partially

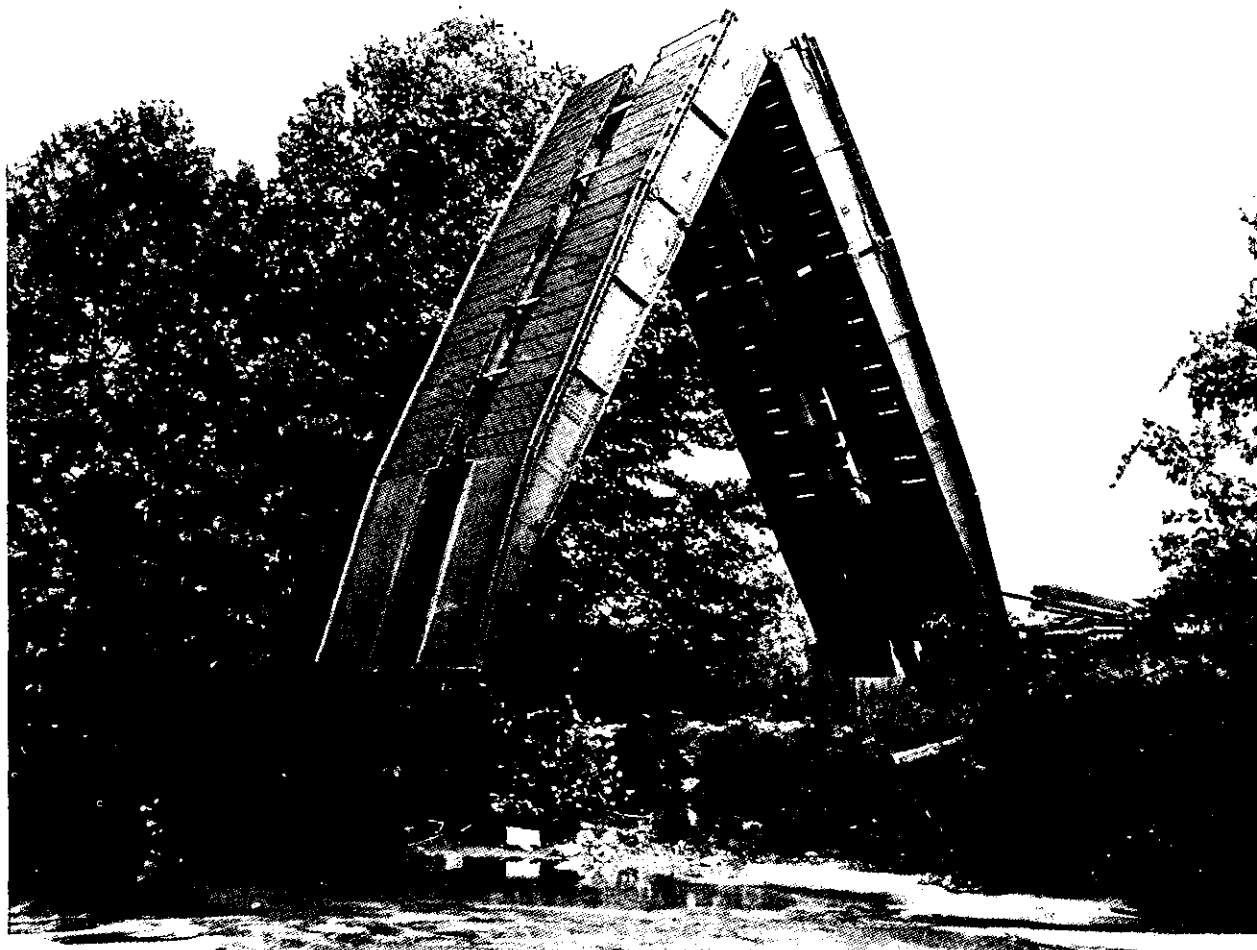


Figure 76. Armored vehicle launched bridge.

blown bridges, and similar obstacles that normally would slow the momentum of attack. Where the flank of friendly forces is on a narrow stream or defile, the assault bridge may be used in supporting a flanking movement. Similarly, where a task force reserve is to be shifted across a front in a minimum of time, assault bridging can be emplaced rapidly, using only a few operating personnel, compared to other type bridging. In retrograde movements, an AVLB can be used in place of conventional bridging that has been destroyed or removed. If time permits, special preparation and stabilization of the launching site will facilitate rapid recovery of the emplaced bridge, thus the launch crew will be exposed to enemy fires for a minimal time. If the bridging cannot be recovered, it must be destroyed.

3. Normal Sequence for Employing the Organic or Attached AVLB

a. A gap is encountered by the leading elements of the task force, or its existence has been determined from intelligence.

b. The proposed crossing site is reconnoitered quickly by the scout elements or by the supporting engineers, or both, to determine the width of the gap, bank conditions, locate access routes, and mark and determine the launching site. The task force commander will normally commit attached assault bridges, if any, from the division engineer battalion before commitment of his organic bridging.

c. On approval for emplacement, an AVLB is brought forward under the overwatching fire of the leading tactical elements and emplaced quickly. The successful emplacement of an assault bridge is reported immediately to brigade. This report should include—

- (1) Bridge location.
- (2) Estimated time task force elements will complete crossing.
- (3) Mechanical condition of bridge.

d. The tactical elements of the task force then cross the assault bridge and resume the attack.

e. When the last tactical element of the task force has crossed and in the absence of orders from the brigade commander to *leave the assault bridge in place*, the task force com-

mander will direct recovery of the emplaced bridge. On recovery of the assault bridge, the AVLB should be afforded route priority in moving it forward to position with the leading tactical elements. The recovery of the bridge must be reported to the next higher headquarters.

4. Other Than Normal Recovery of the Assault Bridge

a. When the brigade commander directs that the assault bridge remain in place to permit the crossing of following tactical units, or to provide routes for subsequent logistical movement, or when the bridge is damaged, or for any other reason the bridge cannot or should not be recovered, the brigade commander takes the following actions:

- (1) Reports his decision immediately to division G3.
- (2) Requests a replacement bridge.
- (3) Establishes a rendezvous for transshipment of the replacement bridge to the organic launcher.

b. Working within the policies established by the division support command commander, the division engineer supply officer may in exceptional cases through command channels, coordinate the delivery to and transfer of a spare assault bridge from the division engineer battalion to the task force. The division engineer battalion may be in the best position to effect the most rapid replacement from within its reserve during a fast-moving situation. If the division engineer battalion has expended its supply, or if priorities prevent such support, the replacement bridge will be made through normal logistic channels. In the example (a above), the procedure is from the brigade commander to the division engineer supply officer in the division supply office, supply and transport battalion, division support command. The division engineer supply officer procures a replacement from an army bridge dump, arranges for its transport, with road priority to the forward rendezvous point with the empty assault bridge launcher, and provides if required, the means for transferring the bridge from the transporter to the launcher. The AVLB would then rejoin its parent task force. Resupply to both the tank and engineer bat-

talions is the responsibility of the division support command.

c. Recovery of emplaced AVLB for reconstitution of the engineer battalion capability or for return to supply channels will be accomplished by engineer elements which construct the replacement crossing means or may be

accomplished as a specific task to effect recovery of an assault bridge for which a replacement crossing means is not required. Authority to effect recovery and responsibility for ultimate recovery of an emplaced AVLB remains with the commander who employed the bridge unless control by a higher echelon has been specified.

APPENDIX XIX

MINE WARFARE

1. Minefield

Mines are among the best of artificial obstacles—they are portable, installed and camouflaged easily and quickly, and constitute a great hazard to the enemy. They delay and canalize enemy movement and can lower the will of enemy soldiers to fight by the fear of casualties they produce. They can be used to support all types of combat operations. Once laid, mines remain a hazard to both the enemy and to friendly forces until neutralized. The mine warfare policy at each echelon must be consistent with the overall concept of operations, including future plans. Commanders may restrict the employment of mines by controlling or revoking authority to employ and prohibiting certain types or use in specified areas. Restrictions on authority and the delegation of authority are mandatory so that smaller units do not engage in mine warfare without the knowledge of a commander responsible for maneuver in the area. Subordinate commanders should be permitted to use mine warfare to achieve economy of force, strengthen the battle position, and delay or disrupt the enemy unless cogent reasons for restrictions exist. Unduly restricting a subordinate commander's use of mines against an enemy who employs mines effectively may adversely affect the unit's ability to perform its mission. Conversely, failure to impose proper restrictions may jeopardize future operations. For information on the employment of land mines, see FM 20-32 and FM 31-10.

2. Minefield Employment Planning

A commander desiring to use mines evaluates their employment by considering the factors of METT—

a. Mission. The tactical plan of operations will determine the type of minefield used, its

size, mine density, location, and extent of safe gaps and lanes.

- (1) *Size.* When plans envision early attack, a minimum effective field only is to be installed. If a prolonged defense is contemplated the minefield should be planned with increased densities and depth to provide maximum effectiveness.
- (2) *Location.* To be most effective, a minefield should be anchored to natural or artificial obstacles. On a short-term basis, minefields should be sited in likely avenues of enemy approach. For prolonged defense, fields should be located to permit later expansion. They must require more time and be more hazardous to breach than to flank. Minefields can be employed skillfully to evolve a tactical plan affording mass targets for artillery and antitank weapons and by channeling an attacking force into a small area covered by massed fires. On a larger scale, minefields may be laid in patterns, so that a penetration of the foremost field will be contained by subsequent fields. Carefully concealed gaps can then be used as counter-attack routes.
- (3) *Lanes and gaps.* Minefield lanes and gaps must be left to allow the unit protecting the field, and adjacent units, to execute operational plans such as patrolling, attacking, and counter-attacking. Lanes and gaps must be located skillfully to prevent easy detection by the enemy. Their trace should be irregular and not follow established roads or paths. Every effort should be made to deceive the enemy of their location. While the

field is being laid out, but before installation of mines, wheeled and tracked vehicles can be used to establish paths through the field, which can later be mined, thus prompting the enemy to think these tracks indicate the trace of safe lanes. The location of lanes and gaps must be changed frequently to prevent detection and subsequent ambush of patrols. In minefields having a high density of small, nonmetallic mines, locations for future lanes and gaps should be determined before the field is installed and more easily detectable mines laid in such areas.

b. Enemy. Enemy capabilities will influence the size, composition, and type of minefield to be laid. The following should be considered:

- (1) The strength and tactics of enemy forces.
- (2) The quality of enemy breaching equipment and the technique and effectiveness of enemy breaching methods.
- (3) The capability of the enemy, sporadically or continuously, to harass, or otherwise interfere with the progress of the laying force. To hinder enemy ground and air observation of mining operations, mines should be sited in folds in the ground, and around blind curves in roads, yet be in a position where they can be covered with fire.

c. Terrain and Weather.

- (1) *Terrain.* Careful analysis of the terrain, for tying in the minefield with natural obstacles, will materially increase the overall effectiveness of the position. The type and bearing capacity of soil must be considered. This is essential to the laying of individual mines ((2) below).
- (2) *Camouflage and concealment.* When analyzing the terrain for employing mines, the weather and the season are considered so the individual mines may be properly concealed to provide an element of surprise on the enemy.
 - (a) When a minefield is to be retained for a long period of time during the spring and summer months, it

should not be laid in grassy pasture areas unless absolutely necessary. Differences in the rate of growth between the grass over the mine and adjacent grass will indicate the location of mines.

- (b) In the fall and winter, minefields are placed where excessive snowdrifts are unlikely to build up, which will interfere with the operation.
- (c) The concealment afforded by the vegetation in the area should be exploited to increase deception and difficulty in clearance by selecting the type of mines that can be camouflaged most easily.
- (d) Minefields should be under friendly observation and fire and so sited as to deny the enemy knowledge of their location.

d. Troops and Mines Available.

- (1) The experience, training, and number of troops and material available will determine the extensiveness and effectiveness of a minefield laid within a specified time limit. The availability of mines in basic loads and supply dumps and restrictions on the use of certain types are important considerations in planning and siting a minefield. When the supply is limited, priorities and controls must be established. In critical areas, mine uses must be specified and quantities allocated carefully.
- (2) Minefields to be effective must be covered by fire. Artillery and antitank fire will destroy damaged or immobilized enemy vehicles, and small-arms fire will prevent enemy troops from breaching the minefields.

3. Employment of Minefields

a. General. Effective employment of mines is dependent upon a thorough knowledge of their function and the tactical use to which they can be applied. Minefields may consist of anti-tank or antipersonnel mines, or both. Minefields are classified functionally as protective, defensive, barrier, nuisance, or phoney (FM 20-32).

Armor units will normally employ the protective or defensive type minefield.

b. Protective Minefield. Protective minefields supplement offensive and defensive fires by providing close-in protection and warning to small units. They may be used to block gaps and lanes through existing obstacles, containing as few as 5 or 6 mines.

- (1) They should contain easily detectable mines that are not laid to any pattern just beyond hand grenade range of the units positions. The mines are laid initially on the surface of the ground and then, time permitting, buried and camouflaged. The mines in this field are normally removed and returned to the units basic load for reuse in future operations unless the field is absorbed into a defensive or barrier minefield.
- (2) Battalion task force commanders have the authority to employ protective minefields and may delegate this authority to company team commanders. They are usually laid on short notice for short duration and should be positioned where they can be covered adequately by small arms and antitank fires of the protected unit. Properly positioned, they may be very effective during short halts, about refueling points, overnight assemblies, as flank security to block roads in defile, and as counterattack obstructions after an objective is taken. The latter use provides an effective obstacle when the enemy has limited maneuver room.

(a) Roadblocks. Antipersonnel mines should be laid around and adjacent to roadblocks to hinder their breaching by the enemy. Antitank mines may also be laid forward of a roadblock; it is desirable also to lay them on the friendly side to add depth to the obstacle. The latter is a deceptive measure since the enemy will move forward quickly once the obstacle is overcome only to encounter mines a few yards beyond.

(b) Approaches to bridges. Mines placed on the approaches to bridges and near the abutments is added assur-

ance of delaying the enemy in case of a misfire in blowing the bridge. Mines near the abutment may, in addition to destroying or disabling a vehicle, render the bridge unusable until repaired. Also, it will hinder the enemy in using this location for a hasty crossing site.

- (c) Ferry sites.* The near and far approaches to ferry sites should be mined to delay the enemy. In the event the enemy breaches the mines on the far approach, the mines laid on the friendly side wall restrict his movement out of the water.
- (d) Fords.* Fords should be mined on the friendly side extending the mines into the water. This method makes it more difficult for the enemy to utilize the ford since vehicles disabled by a mine will block the ford.

c. Laying of Individual Mines.

- (1) *General.* Mines may be laid on top of the ground and concealed by covering them with leaves, brush, grass, or other materials natural to the surroundings. Mines may also be buried and camouflaged. If they are placed under sod, the turf should be carefully cut, rolled back, then replaced over the mine after it is positioned in the ground. In soft snow up to 4 inches in depth, mines may be placed in the snow resting upon the ground. On ice or hard-packed snow, mines may be painted white and placed on the surface. Pull-type firing devices only should be used to boobytrap mines when employed in snow; other types will collect moisture, freeze, and become inoperative, or melting snow or ice may cause the device is set off the mine. Tripwires should be (3 or 4 feet) above snow because a taut tripwire or one close to the surface of snow is easily seen. Regardless of the season, camouflage is important in the laying of mines. All spoil, mine containers, tape, and other working materials must be removed from the mined area. Deceptive measures, such

as making tracks in grassed areas and snow before the mines are laid may be used also.

- (2) *Antitank mines.* Antitank mines are placed in holes dug 2 or 3 inches larger than the mine at bottom and sloped outward at an angle of about 45° toward the surface. The depth of the hole should be such that the pressure plate of the mine is flush with to not more than 1/2-inch above the ground (fig. 77). If the soil is soft or spongy, a piece of board or a stone is placed under the mine to provide a solid foundation. The earth removed from the hole is used to back fill in around the mine and provide 1 and 1/2-inch covering over the mine. Excess soil is removed from the mine-field. If mines are layed in grassed

areas, the sod may be folded over the top of the mine, providing the proper depth of cover. The fuzing and arming of antitank mines are described in TM 9-1940.

- (3) *Antipersonnel mines.* The methods for laying, fuzing, and arming of antipersonnel mines vary considerably, depending upon the type of mine (TM 9-1940). In general, antipersonnel mines are buried with the fuze extending above the ground because they are set off by stepping on the fuze or by pulling or cutting a trip wire attached to the fuze. When trip wires are used, the far end of the wire must be anchored firmly. Care in camouflage is essential; this includes the removal of excess soil from the holes out of the mined area.

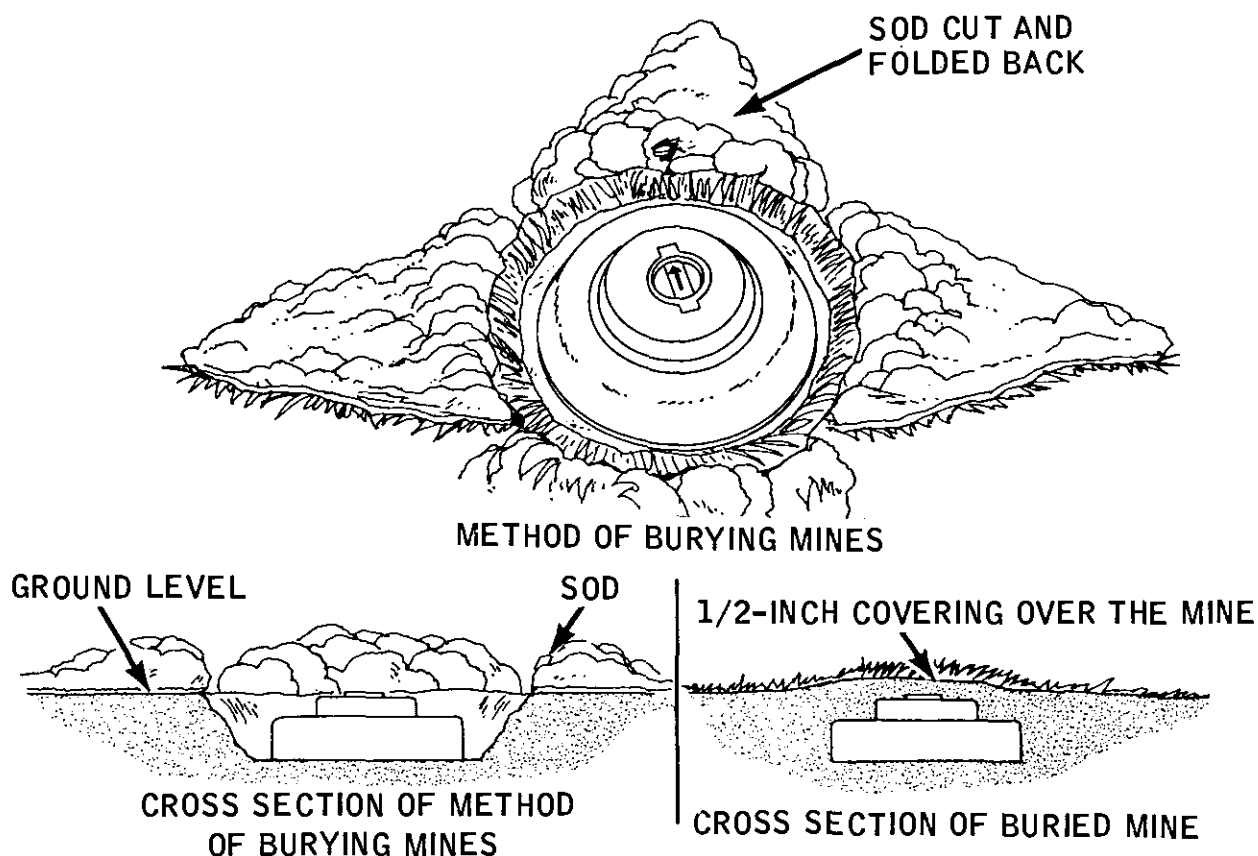


Figure 77. Burying of mines.

d. *Battle Drill.* The following battle drill is designed for tank crews and infantry fire teams in the rapid laying of protective minefields.

- (1) *Tank crew.* The tank commander and the loader dismount, each carrying two antitank mines. The gunner assumes the position of the tank commander, mans the tank weapons providing covering fire and directs the driver to maneuver the tank when required. The tank commander positions the mines on the surface of the ground. The loader fuzes, arms, and camouflages each mine; time permitting they may be buried. If more mines are required, either or both crew members return to the tank for the mines, which are normally carried in the basket on the back of the tank. Each man returns to the tank as soon as his duties are completed. The safety clips from the fuzes are retained for re-use if the mines are recovered. The tank commander reports the mines in position and prepares a simple minefield location report giving the pattern, number of mines and location for the platoon leader who forwards it to the company team commander. If later actions prevent neutralization of the protective minefield, the company team commander forwards the record to the battalion task force commander for appropriate action.
- (2) *Mechanized rifle squad.* The driver of the armored personnel carrier (APC) remains with the vehicle; other persons dismount carrying two mines each, except the leader who carries the mine fuzes. The driver moves the APC to a covered position and mans the vehicle machinegun. The squad or fire team leader points out where each man is to position the mine on the ground, leaving the fuzes near the first mine. The first man to lay his mines takes the fuzes and proceeds to fuze and arm each mine. The second man, following immediately behind the man fuzing and arming the mines, checks each mine to see if it is armed, then camouflages each mine; time permit-

ing they may be buried. Each man returns to the APC as soon as his duties are completed. The squad leader reports the mines in position and prepares a simple minefield location record giving the pattern, number of mines, and location for the platoon leader who forwards it to the company team commander. If later actions prevent neutralization of the protective minefield, the company team commander forwards the record to the battalion task force commander for appropriate action.

e. *Defensive Minefields.* Defensive minefields are laid in accordance with the tactical plan between, in front of, or on the flanks of, positions occupied to delay and disorganize enemy attacks, and to defeat or limit enemy penetration into the tactical positions. All types of mines, flares, warning devices, and boobytraps should be used. Defensive minefields should be integrated with the plan of fire support and covered by artillery, mortar, machinegun, and antitank fire. Barrages should not be laid on the minefields but sited on their outer edges. Defensive minefield records should be prepared simultaneously with the laying, using DA Form 1355, and will normally be forwarded at least to division headquarters. For details of records and reports, see FM 20-32. Defensive minefields are laid to a standard pattern, consisting of the following elements (fig. 78) :

- (1) *Mine cluster.* A mine cluster is the basic unit of the standard pattern minefield. It may contain from 1 to 5 mines. When more than 1 mine is used the additional mines are placed within a 2-pace radius of the base mine. The base mine is usually an antitank mine. In an antipersonnel minefield an antipersonnel mine will be the base mine. When toxic chemical mines are to be integrated in a composite minefield, they can be employed best at a rate of 1 for every 4 clusters, the chemical mine being substituted for an antipersonnel mine. Clusters are placed in rows with 6-pace intervals between the base mines.
- (2) *Mine strip.* Two rows of clusters constitute a mine strip. The rows are 6

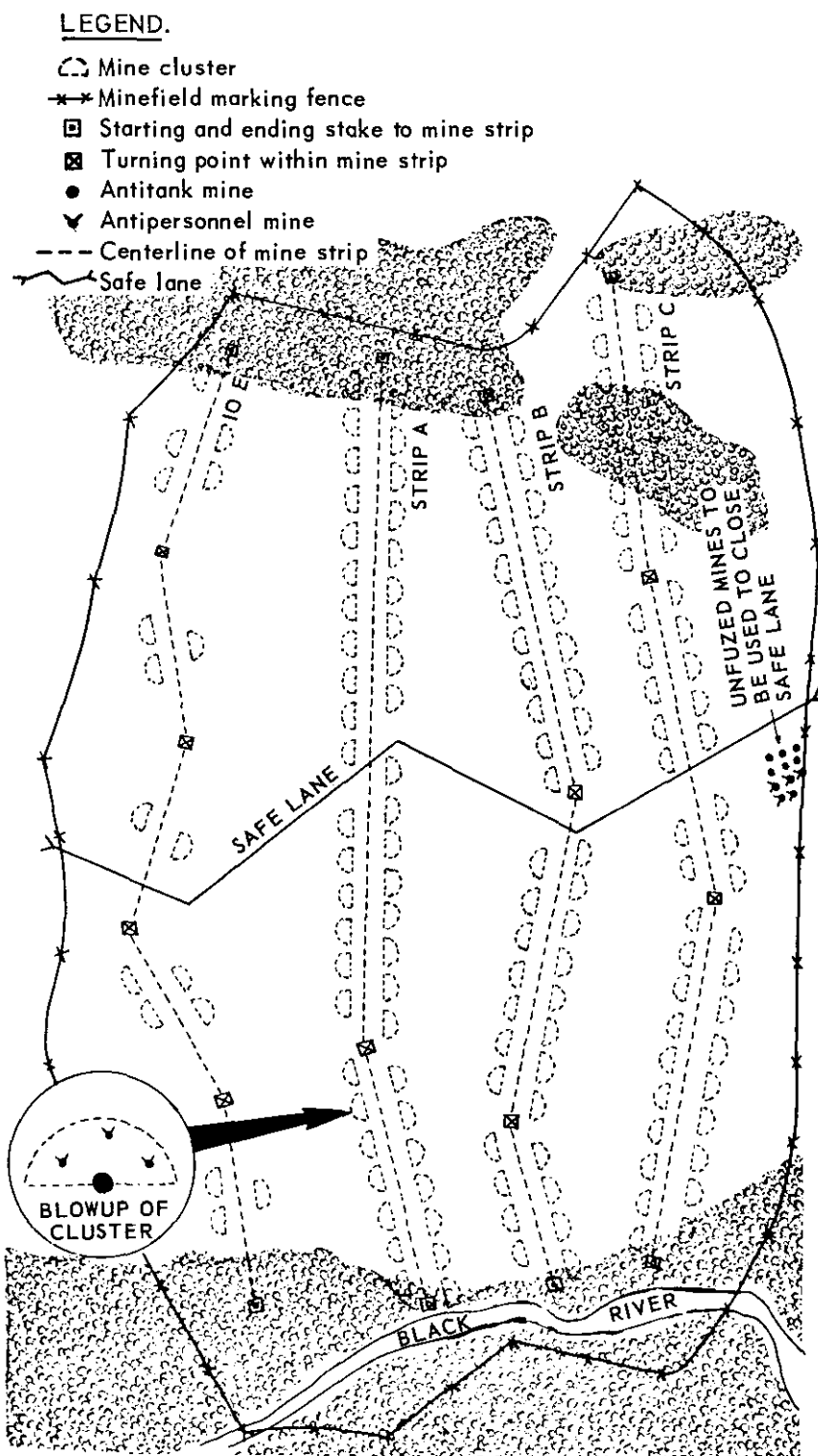


Figure 78. Standard pattern minefield.

paces apart, being 3 paces on either side from the centerline, thus leaving a 6-pace safety lane between the 2 rows of the strip. The clusters in the 2 rows are staggered so that they are located at 3-pace intervals alternating right and left of the centerline. The open sides of the clusters in both rows are toward the centerline of the strip. If tripwires are used, they are placed on antipersonnel mines in the front row, not more than one tripwire-activated mine to a cluster, and no closer than every third cluster. Tripwires should not point back toward the strip centerline, and must not be closer than 2 paces to another cluster or another tripwire. The length of the tripwire should not exceed the casualty radius of the mine to which it is attached. Mine strips are lettered A, B, C, D, etc., from the front to the rear, and must be at least 18 paces apart. The strips need not be parallel; a centerline may have as many turning points as desired. A standard pattern minefield contains a minimum of three regular strips and an irregular outer edge (IOE). The IOE contains approximately one-third the number of clusters as does the regular strips. For details for the laying of this type mine strip see FM 20-32.

4. Reporting and Marking of Enemy Minefields

a. Any knowledge or suspicion of enemy minefields must be reported immediately to the next higher headquarters, using the fastest means available. This report should contain as much of the following information as possible without delaying the initial information; details are forwarded as they become available:

- (1) Location and boundaries of the minefield.
- (2) Bypasses, if any.
- (3) Type and density of the mines.
- (4) Patterns.
- (5) Enemy resistance, defensive positions, type of fire covering the minefield, type of enemy fortifications, and enemy observation points, if known.

b. The unit that encounters an enemy minefield or mined area is responsible for posting warning signs on approaches to the field. These signs may be of the standard type or constructed expeditiously, such as a C ration box nailed to a tree reading: "Mines Ahead," or "Mined Area."

5. Detecting Mines

a. One method of detecting mines is to use an electronic mine detector. However, all personnel must be trained to detect mines by visual means and by probing since mine detectors are not issued to all units or may not be available when needed.

b. Visual inspection combined with experience pertaining to the habits of the enemy will often be a great aid in detecting mines. In general, the following are likely locations for mines:

- (1) Near any unusual object that may have been placed by the enemy, such as a mine marker or a large stone along the side of a road.
- (2) Near souvenir items or materials such as a helmet, field glasses, pistol, or a bottle of liquor.
- (3) Buildings or areas that would be ideal locations for a CP or assembly area. A careless or hurried enemy may leave evidence of laying mines; such indications may be disturbed soil, debris of mine packages, field markings to warn his own troops, such as piles of stones, flags, or fences.
- (4) Pet holes, soft spots, broken areas, and freshly repaired patches in surfaced roads.
- (5) Along the shoulders, turnoffs, and under the edges of the road surfaces.
- (6) In logical bypasses around an existing obstacle and just beyond an obstacle that is not difficult to overcome.
- (7) The edges of road craters and approaches to bridges, ferries, and fords.
- (8) In barbed wire entanglements, along fencelines, or among fallen trees and limbs extending across roads or trails.
- (9) Narrow defiles and other places where it is natural to drive a vehicle or walk.

c. Probing is a positive means of locating mines by penetrating the surface of the earth with any sharp instrument. Such items as a screwdriver, section of an antenna, ammunition box bolt, mess kit knife, and a cleaning rod may be used when probes or bayonets are not available. Probing requires very little training and may be accomplished during darkness as well as daylight. A disadvantage is that it is slow and close controls are necessary to insure that no mines are overlooked in the path being cleared.

d. To prepare for probing the soldier rolls up his sleeves to increase the sensitivity to contact with trip wires. Watches and rings are removed to preclude entanglement. The prober then moves on hands and knees, looking and feeling forward for tripwires and pressure prongs of mines before he probes. After looking and feeling forward, the prober probes either from his left or right, inserting the probe into the ground 6 to 8 inches at an angle of less than 45°. After he has probed across his front, a width of about 3 feet, he moves forward about 6 inches, observes, feels for tripwires, probes; he repeats this procedure until a solid object is touched beneath the surface of the ground; he will then probe around it to determine its approximate location and size. He must be careful to insert his probe gently in the ground at an angle of less than 45° each time, because if the probe is pushed straight down with considerable force, it may detonate a mine. He then carefully uncovers the object; if it is a mine, it is neutralized.

6. Hasty Breaching of Minefields

Armor units are concerned primarily with hasty breaching of enemy minefields. To maintain the momentum of the attack, this method will be the rule rather than the exception in fast-moving armor operations. Hasty breaching requires speed with little time and minimum reconnaissance or planning. The leading elements must accomplish breaching by any and all means available to create rapidly a mine-free lane through the mined area. This may be accomplished by special mechanical or explosive means as described in FM 20-32, and FM 5-25. Herds of animals may be driven through the field; barrels or large stones rolled

down hills; a damaged tank may be pushed through the field; a tank dozer may doze a path of earth over the top of existing mines; a helicopter may drag a cable through the field or pull a vehicle through the field. If no other means is immediately available a mine-free lane wide enough for a tank may be provided by probing. If this method is used and materials are not available to guide individual probers in a staggered formation, a minimum of seven men may be placed side by side to probe the necessary width, each prober following the procedures described in paragraph 5c and d (fig. 79). In armor operations, hasty breaching methods will be initiated when minefields are encountered and cannot be bypassed. The procedure and techniques for deliberate breaching of minefields, which is primarily an engineer responsibility are explained in FM 20-32.

7. Removal of Mines

a. The safest method of dispose of enemy mines is to blow them in place. An explosive charge is placed on each mine and detonated from a safe distance. If explosives are not available or the explosions may alert the enemy, damage bridges, block passage, or damage useful installations, other methods described (b and c below) must be used. Handlifting should be avoided when unfamiliar mines are encountered. If lifting is necessary the man who is handlifting the mine is equipped with a sound-power phone or small radio, and he relays back, step by step, what he is doing. This is recorded to train others. If this person becomes a casualty, the record provides valuable information for the next time this type of mine must be handlifted.

b. A rope or wire may be attached to the mine that is long enough for a person to get in a safe place to pull the mine out of the ground. A grapnel attached to a length of communication wire or rope may be used to clear an area of tripwires before individuals probe for mines and, also to hook onto a mine to pull it out of the ground. A grapnel may be made of ammunition box bolts or similar materials. To clear an area of tripwires, the grapnel is thrown out over the area concerned; the loose end of the rope or wire is tied to the individual's wrist to avoid losing the complete assembly when it is tossed. It is then pulled back and as this is accom-



Figure 79. Probing to locate mines.

plished, it will set off tripwire-activated mines. The person throwing the grapnel must drop to the ground in a defiladed position before the rope or wire and grapnel, hits the ground because this may provide the necessary force to actuate a mine. When used to pull out mines, the grapnel is hooked gently into the side, fuze well, or carrying handle of the mine. The rope attached to the grapnel is laid out with care so as not to place tension on the rope until the person pulling out the mine is in a safe place to pull, such as a shell hole, ditch, or behind a large log.

c. When neither of the above methods may be used, the mines are handlifted. This is the least

desirable method and is resorted to only when absolutely necessary, such as when secrecy of removal is required or if destruction in place will damage some usable facility or create an undesirable obstacle. This method is time-consuming and very dangerous. Instructions for disarming US Army mines are presented in TM 9-1940, and instructions on known foreign army mines in TM 5-280. Some of the precautions for handlifting of mines are—

- (1) Always work alone on a mine.
- (2) First examine carefully the ground around the mine before starting to work for other mines, tripwires, and boobytraps.

- (3) Never pull or cut a tripwire—locate the device to which it is attached; render the device safe; then disconnect the wire.
- (4) Next, remove the earth slowly from the top of the mine; locate and remove very carefully all the fuzes to the mine.
- (5) Never apply force, shift, tilt, or move a mine until it is believed to be neutralized.
- (6) Then, remove the earth slowly from around the sides of the mine; inspect for antilift devices, and if any are found, render them safe. Others may be located underneath the mine which must also be made safe.
- (7) A mine is safe when the firing chain is broken; always look for more than one firing chain.

APPENDIX XX

OBSTACLE PLANNING, EMPLOYMENT, AND EXECUTION

1. General

A well-constructed obstacle is designed to impede the enemy. A coordinated series of obstacles are positioned and constructed to halt, canalize, restrict, or delay an advancing force. This coordinated series of obstacles may constitute a barrier. A barrier plan is normally a part of an operations order at brigade or higher, or it may be initiated by fragmentary orders or sketches and implemented at battalion task force level, or below, whenever the tactical situation warrants. For example, front line companies may automatically lay protective minefields, using their basic load of mines, during short halts. This is not to be construed as being the sole obstacle effort of these companies as there are many types of obstacles that a company team or platoon can employ. Employment of all types of obstacles must be considered both natural and artificial, in any tactical situation. For a detailed discussion of obstacles and barrier planning see FM 31-10. See inclosure 1, example, obstacle plan.

2. Obstacles

a. An obstacle is any obstruction that restricts, delays, diverts, or stops movement. Obstacles are of two general categories—natural and artificial.

- (1) Natural obstacles are natural terrain features such as steep slopes, rivers, gulches, soil conditions, or they may be manmade objects such as canals, embankments, and built-up areas not originally erected to serve as obstacles.
- (2) Artificial obstacles such as demolished bridges, roadblocks, minefields, or dam destruction to cause flooding, are constructed to stop or impede military movement.

b. Commanders use natural obstacles, usually strengthened by artificial obstacles, in the or-

ganization of the ground. The authority to supplement natural obstacles with artificial ones is delegated to the lowest level consistent with the need for the obstacles being employed. For example, the company team must have the authority to construct obstacles that will augment their close-in protection against armor and personnel during short halts. The type of obstacles that may be employed are an antipersonnel mine, to cover avenues of approach; placement of explosive charges on trees to be felled as roadblocks; protective minefields, using easy-to-detect antitank and antipersonnel mines, and wire entanglements. Flares should be used in conjunction with obstacles to warn of enemy activity forward of the obstacles during darkness. The development of an extensive system of coordinated obstacles of major tactical significance will be as directed by brigade or higher.

c. The following reports pertaining to obstacles are required:

- (1) *Report of intention.* When a commander intends to install an obstacle, the type, location, and estimated time of completion are reported to the next higher headquarters. Work may start immediately following the submitting of this report. The higher commander's silence in response indicates his approval for installation.
- (2) *Report of completion.* The report of completion confirms the installation of the obstacle.

d. The S3 has the staff responsibility for the tactical employment of obstacles and the integration of natural and artificial obstacles with the overall tactical plan. To accomplish this, he considers the commander's plan of action, recommendations and advice from the S2, logistical data from the S4, and technical advice from the supporting engineer commander as follows:

- (1) Based upon the terrain study and reconnaissance, the S2 evaluates the terrain in relation to the tactical plan, thus providing the S3 with an analysis of the natural obstacle value of the terrain together with the weather and the enemy situation and capabilities.
- (2) The S4 has the staff responsibility for the logistical aspects of obstacle employment. This includes the priorities for allocation of obstacle materials, labor and the coordination of the transportation for this material to the obstacle site.
- (3) The attached or supporting engineer commander will conduct reconnaissance of the area, prepare estimates on time, labor, and materials required to augment natural obstacles, and make recommendations on the use of artificial obstacles. The engineer commander will provide technical advice, special equipment, and the preparation of obstacles designated by the unit that they are supporting.

3. Tactical Employment

a. Obstacles are used in the offense and defense to supplement fires. When a position is established, first priority should go to the fires covering the existing obstacles. Priority is then given to the construction of obstacles to strengthen existing ones. Covering fire receives the highest priority since an obstacle is of little value unless covered by fire. Artillery and main tank gun fires can destroy enemy vehicles entrapped by an obstacle and small arms fire can prevent dismounted persons from breaching obstacles.

b. A good obstacle site is inconspicuous to the enemy and can be protected with friendly fires to prevent its easy neutralization. A system of obstacles should be placed on likely or favorable enemy avenues of approach, yet allow for the withdrawal of defending troops, and the maneuver of counterattacking and other maneuvering forces.

c. Obstacles may be used effectively in offensive operations, for example, protective minefields, roadblocks, or felled trees on likely enemy avenues of approach as enemy counterattack

obstructions following the seizure of an objective. These obstacles will supplement protective fires, and assist in the consolidation and reorganization phase. They become more important when the enemy has limited maneuver room.

d. To provide the necessary forces for use elsewhere, a brigade commander may extend a company team or task force frontage. Obstacles assist in the situation as flank security, filling gaps between strongpoints, or as counterattack obstructions.

e. Obstacles employed on flanks of any attacking force have proved successful. However, the availability of forces to install and protect flank obstacles must be considered. Roadblocks and minefields are examples of obstacles used to assist in flank security.

f. Obstacles employed by helicopterborne and airborne forces to entrap or block the enemy's routes of withdrawal can be of great assistance in any offensive operation. These forces can block defiles in rough terrain, demolish bridges, or use destroyed equipment to create obstacles.

g. Obstacles are important in defensive operations and retrograde movements. An effective way to impede an enemy advance is to employ a mixed minefield that will separate the enemy armor elements from infantry, or develop a flank obstacle system that will limit lateral movement by the enemy, thereby permitting defeat in detail. Obstacles may be employed to canalize the enemy into an area for his destruction, or used to deny him key terrain.

4. Construction Responsibilities

Each tactical unit is responsible for the construction of obstacles for close-in protection, using organic pioneer tools, including those from vehicles, and nonelectric demolition sets, basic load of mines, and tank dozers. The effort of the engineer unit should be used primarily in constructing obstacles requiring special skills and equipment and obstacles that add depth to the battle position. Once the engineers have completed an obstacle, or prepared a demolition for execution, the responsibility of security and execution should be assigned to the unit responsible for the battle position, releasing the engineer units to accomplish other obstacles or missions.

5. Execution of Obstacles

a. The commander responsible for ordering the execution of an obstacle that is important to the tactical plan such as blowing a tank crater, key bridge, or a dam, will—

- (1) Establish a clearcut command channel whereby the order to fire the demolition is transmitted from himself to the commander of the demolition firing party.
- (2) Insure that this channel is known and understood by all concerned.
- (3) Insure that a positive, secure means for transmitting the order to fire is established.
- (4) Determine the requirements and allot responsibility for a demolition guard.

b. Obstacles of which the tactical commander controls the time of execution, are called reserved demolitions. Orders to the commander of the demolition firing party of these reserved demolitions are written whenever time and conditions permit, using DA Form 2050-R. The tactical commander will complete parts I, II, and III of this form before it is issued to the commander of the demolition firing party, who will retain the form until the demolition is fired.

c. A demolition order should specify whether the demolition guard commander (or if there is no demolition guard, the commander of the demolition firing party) is authorized to fire the demolition, if the enemy is in the act of capturing it. The consequence of premature or ill-advised execution could be disastrous to the operation; a tactical commander must choose carefully the technique of command control for execution of a reserved demolition. The following techniques may be used:

- (1) *Direct order of a specific commander.* A direct order from a commander who has, or has been delegated, the authority to execute a reserve demolition is the most frequent control used. For example, during a delaying action, this commander will instruct the demoli-

tion guard commander to blow the bridge after a specific unit has cleared the bridge and its commander has stated words to the effect "all clear, blow the bridge."

- (2) *At a definite time and date.* When the tactical situation is such that unforeseen events are not probable, the appropriate commander may specify a time for execution of the obstacle. This method is seldom used except when the obstacle plan is such that a part of it can be accomplished by a time table.
- (3) *On receipt of a preassigned code word.* On receipt and authentication of a preassigned code word the commander of the demolition firing party would execute the obstacle.
- (4) *As soon as prepared.* In a pressing situation the commander may direct the obstacle be executed as soon as it can be prepared.
- (5) *To prevent capture.* For example, a commander may plan to use a specific route or bridge in the near future and yet there is a possibility it may fall into enemy hands. Orders to the demolition guard would be to destroy, only to prevent capture by the enemy. This method is used frequently in connection with one of the other methods ((1)–(4) above).

d. The tactical commander responsible for the execution of obstacles should designate a staff officer or a subordinate commander who is familiar with the tactical situation to be at the obstacle site and control the activities of the demolition crew. The execution must *not* be at the discretion of the demolition party. Obstacle planning and construction requires much effort, time, logistical support, and strict coordination is necessary for both construction and execution. The results will only be as effective as the planning and execution controls of the commander and his staff.

EXAMPLE OF OBSTACLE PLAN

(Classification)

Copy No. 2
 1st Brigade, 25th Armd Div
 BREITENLONE (PV1228),
 GERMANY
 122300 Jun 19__
 CS523

Annex C (Obstacle Plan) to OPORD 3

Reference: Map, GERMANY, 1:25,000, WASSERTRUDINGEN,
 OTTINGEN I BAY, WEILTINGEN, and
 UNTERSCHNEIDHEIM sheets.

1. SITUATION

- a. Enemy forces, par. 1a to OPORD 3.
- b. Friendly forces, par. 1b to OPORD 3.
- c. Attachments and detachments. Task organization to OPORD 3 unchanged.

2. MISSION

1st Bde defends in sector without delay. Initially prepares obstacles to strengthen positions along FEBA; denies final key terrain in sector and supports brigade counterattack force.

3. EXECUTION

- a. Concept of operations.
 - (1) Par. 3a to OPORD 3.
 - (2) Obstacles on and forward of FEBA are designed to permit greater dispersion of friendly forces, to impede enemy movement, and compel massing of enemy forces to penetrate our position.
 - (3) Directed obstacles.
 - (a) TF 2/13 Armor.

Obstacle No.	Location	Description	Priority	Unit Responsible for Execution	Remarks
508	PV176313	Roadblock-abatis.	1	TF 2/13 Armor	See appendix 1, (material and effort list, obstacle no. 508).
509	PV185309	Road crater	1	TF 2/13 Armor	See appendix 2, (material and effort list, obstacle no. 509).
	(b) TF 2/14 Armor.				
511	PV216296	Bridge	1	TF 2/14 Armor	See appendix 3, (material and effort list, obstacle no. 511).

(Classification)

(Classification)

Obstacle No.	Location	Description	Priority	Unit Responsible for Execution	Remarks
513	PV178279	Civilian ferry (swinging type).	1	TF 2/14 Armor	Sink ferry; cut towers and cable; mine each bank.
546	PV135281	Control gate, dam, and culvert.	2	TF 2/14 Armor	See appendix 5, (material and effort list, obstacle no. 546).
514	(c) TF 2/91 Inf. PV183269	Wooden foot bridge.	3	TF 2/91 Inf.	Destroy by burning.
521	PV182237	RR bridge	1	1 Bde	See appendix 4, (material and effort list, obstacle no. 521).

b. Coordinating instructions. Appendix 6 (barrier trace and obstacle location).

- (1) Task force commanders coordinate extent of gaps and lanes with adjacent units and covering force. Direct liaison authorized.
- (2) Company team commanders prepare additional obstacles along barrier trace to prevent enemy penetration. Maximum use of protective and defensive minefields.
- (3) Priority for preparation of obstacles.
 - (a) Directed obstacles.
 - (b) Other obstacles.
- (4) Priority for engineer effort. (One engineer platoon DS each TF.)
 - (a) Directed obstacles.
 - (b) Counterattack routes.
 - (c) Routes between strongpoints.
 - (d) Supplementary positions.
 - (e) Other obstacles.
- (5) Demolition of bridges, and construction of road craters and road-blocks in rear of blocking positions on brigade authority only.
- (6) Counterattack and support routes will be kept open. Portable obstacles or demolitions will be prepared for closure on brigade order.
- (7) All obstacles will be covered with heavy weapons fire; small arms fire coverage wherever possible.
- (8) Demolition guard on directed obstacles provided by unit responsible for execution.

4. ADMINISTRATION AND LOGISTICS

- a. ADMINO 2.
- b. AP and APers mines, dml, napalm, minefield marking kits avail ASP.
- c. C1 II and IV fortification materials, engr spt.

(Classification)

(Classification)

5. COMMAND AND SIGNAL

- a. Signal. SOI 1-5.
- b. Reports.
 - (1) Minefields: SOP.
 - (2) Other obstacles: report location, type, extent, and estimated time of completion.

Acknowledge.

HOWARD
Lt Col

Appendixes:

Material Efforts Lists—

- 1—Material and effort list, Obstacle No. 508
- 2—Material and effort list, Obstacle No. 509 (omitted)
- 3—Material and effort list, Obstacle No. 511 (omitted)
- 4—Material and effort list, Obstacle No. 521 (omitted)
- 5—Material and effort list, Obstacle No. 546 (omitted)
- 6—Barrier Trace and Obstacle Location

Distribution: A

OFFICIAL:

/s/ Jameson

JAMESON

S3

Copy No. ----
1st Brigade, 25th Armd Div
BRIETENLONE (PV1228),
GERMANY
122300 Jun 19__
CX523

Appendix 1 (Material and Effort List, Obstacle No. 508) to Annex C
(Obstacle Plan) to OPORD 3.

1. TARGET NUMBER AND LOCATION

No. 508, PV176313 (Roadblock-abatis).

2. EXPLOSIVES REQUIRED

2,000 feet, detonating cord.
216 pounds, composition C3.
4 nonelectric blasting caps.

3. MINES REQUIRED

9 Antitank (M15).
8 Antipersonnel (M16 frag).

4. EFFORT REQUIRED

One 10-man squad 1½ hours.

5. EQUIPMENT REQUIRED

One demolition set, explosive initiating, nonelectric.

(Classification)

(Classification)

6. MATERIAL LOCATION

ASP No. 9152, NV 8922.

7. REMARKS

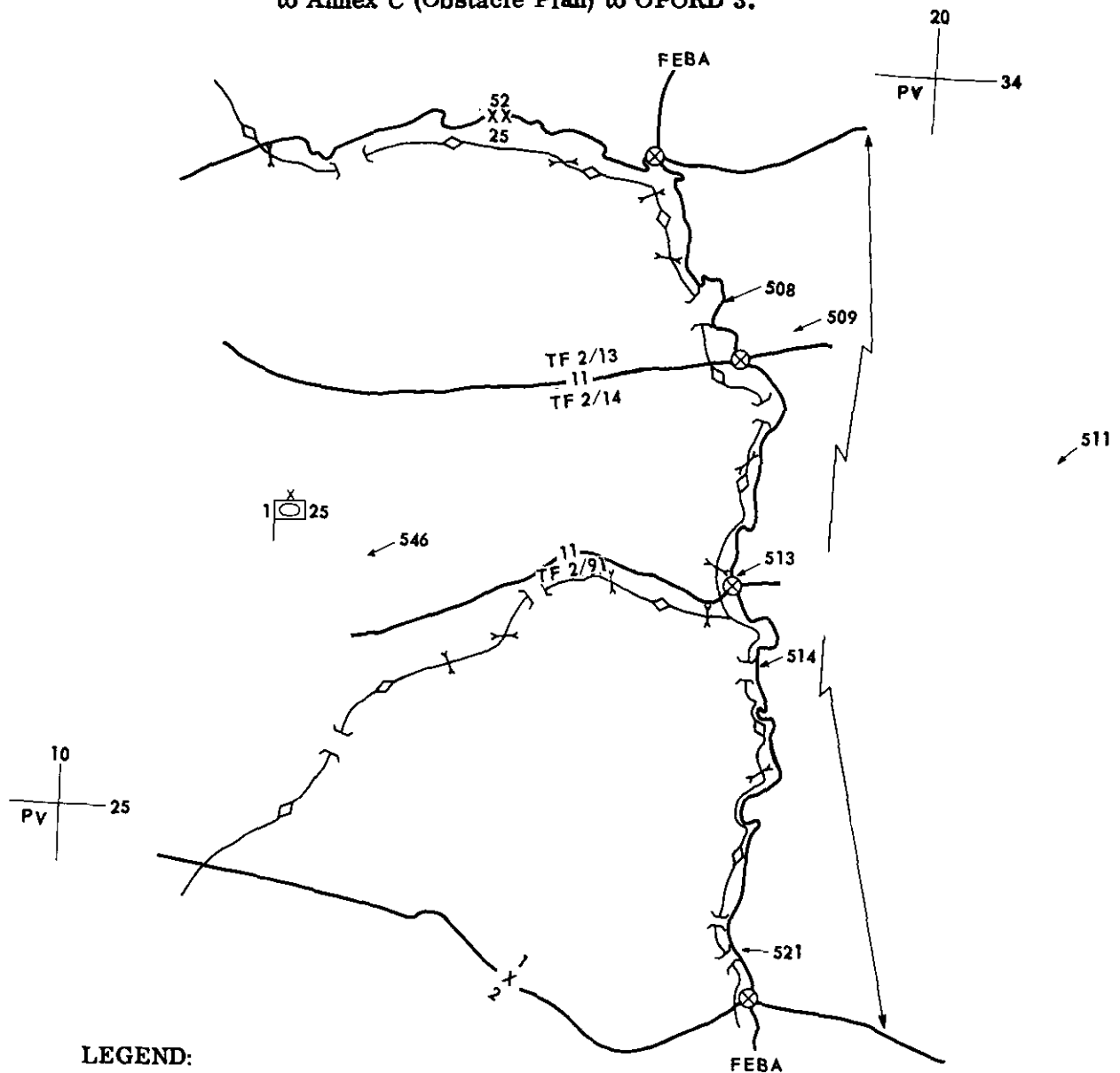
- a. External charges on all trees.
- b. Use detonating cord ring main.
- c. Fell trees at angle towards center of road with tops of felled trees facing enemy.
- d. Place antipersonnel mines in the felled trees on enemy side. Bury antitank mines across road bed and shoulders 25 yards on friendly side (rear) of abatis.

Appendix 6 (Barrier Trace and Obstacle Location) to Annex C (Obstacle Plan) to OPORD 3.

(Classification)

(Classification)

Appendix 6 (Barrier Trace and Obstacle Location)
to Annex C (Obstacle Plan) to OPORD 3.



LEGEND:

Barrier containing tank obstacles, type unspecified

Lane through barrier

Gap in barrier

Obstacle (number) directed by higher headquarters. Type and details included in obstacle plan

(Classification)

Figure 80. Example (barrier trace and obstacle location).

APPENDIX XXI

TACTICAL EMPLOYMENT AND COMMAND CONTROL OF
ATOMIC DEMOLITION MUNITIONS (ADM)

Section I. TACTICAL CHARACTERISTICS OF ATOMIC DEMOLITION MUNITIONS (ADM)

1. General

The atomic demolition munition (ADM) provides armor with an explosive capability contained in a relatively small package, but the equal of many tons of conventional explosives. This capability may be used to demolish natural or manmade features, or create obstacles. Points of burst other than on the surface may make use of existing structures or require preparation of platforms or excavations.

2. Employment

a. General. Instructions governing the employment of atomic demolition munitions will be published separately by the theater commander in accordance with national policies and instructions from higher headquarters. ADM's may be employed effectively to create barriers in certain situations and are particularly useful in effecting denial to the enemy of large strategic installations such as a communication center. The atomic demolition plan may appear as an appendix to the barrier plan or denial plan or as a part of the fire plan appendix to the fire support annex to the operations plan.

b. Uses. Atomic demolition munitions have application to most armor operations as a nuclear weapon or as a demolition charge.

(1) *Offense.*

- (a) Protect a flank (i.e., create a landslide, carter, or an obstacle in the form of tree blowdown or rubble that would preclude enemy penetrations).
- (b) Demolition in a heavily fortified area.
- (c) Obstruct a withdrawing enemy force.

(2) *Defense and delay.*

- (a) Block constricted avenues of approach.
- (b) Sever lateral routes of communication in front of friendly positions by clandestine emplacement.
- (c) Canalize the enemy.
- (d) Inhibit enemy movement.
- (e) Demolish key tactical targets.

3. Tactical Characteristics

a. No Delivery Error. The ADM, with its extreme accuracy (that is, zero CEP) can be emplaced exactly where desired. This accuracy allows use of minimum yields to accomplish the mission.

b. Simplified Target Acquisition. Target acquisition for the ADM presents no problem. Targets, such as prominent terrain features or manmade installations, are determined easily and do not move. The emplacement site may be selected as part of plan of maneuver.

c. Flexibility of Delivery. The method of ADM delivery is flexible. Depending on the type ADM used and location of the target, transport can be accomplished in any of several ways—armored personnel carrier, helicopter (either internally or externally), truck, or man. External carry is authorized only in war time.

d. Massive Destruction. The ADM can do jobs not practicable with conventional explosives. Because much less time and logistical effort are required, and because the ADM has the capability of moving quantities of earth not previously possible, missions such as blocking major passes and destroying completely major installations may be accomplished in the time available in a tactical situation. Further, it can destroy targets or items that cannot be attacked

by any other nuclear delivery means (e.g., underground emplacement).

e. Emplacement Site Control and Security. The employment of the ADM requires that the immediate area of ADM emplacement must be under friendly control or occupancy for the period of the time required to emplace and assemble the munition. Furthermore, provisions must be made to protect an emplaced ADM from the time the emplacement site is evacuated until the time of detonation. An ADM normally requires a maximum of 2 hours to emplace and prepare for firing if the emplacement site requires no preparation. After attainment

of this armed condition, the munition may be fired within 5 minutes after the tactical commander makes the decision to fire. The number of successive rounds that may be fired is limited only by the available engineer effort. An engineer squad supplemented with other technically trained engineer personnel is the smallest size engineer unit capable of an ADM mission.

f. Time Saver. The demolition of targets can be accomplished quickly and efficiently with an ADM; whereas use of conventional explosives is a tremendous manpower and time-consuming task.

Section II. TACTICAL EMPLOYMENT AND COMMAND CONTROL

4. Command and Staff Responsibilities

a. General. The tactical use of an ADM does not alter command and staff relationships or procedures as authorized in FM 101-5. Planning phases and staff actions for ADM missions are essentially the same as for the employment of other nuclear weapons. Detailed planning for the tactical employment of ADM will seldom be accomplished below brigade level. However, staff planning at all echelons must consider formulating and promulgating directives, policies, and SOP's containing ADM information and guidance for subordinate units. Furthermore, authority for ordering an ADM mission (i.e., a surface or subsurface nuclear detonation) will not be fixed at any echelon of command, except as directed by the senior tactical commander in the area of operations. Normally, this authority will be delegated to the lowest commander exercising control over the area of militarily significant fallout resulting from the burst, which for an ALFA (0.5 KT) weapon could be at battalion task force level.

b. Command Responsibilities.

- (1) An allocation of an ADM, usually included in the nuclear weapons allocation, is made by a commander to subordinate commanders for a specific phase of an operation or period of time. This allocation is expressed as a number of specific type and field ADM's.
- (2) Authority to fire is provided implicitly by the allocation of the ADM. How-

ever, this authority is subject to normal requirements for troop warning, coordination, and other specific instructions.

- (3) Commanders having physical control of ADM's are responsible for their security.

c. Staff Responsibilities.

- (1) *General.* Nuclear weapons employment officers (NWE0) are provided in the staff organizations of the G2, G3, Artillery, and Engineer staff sections at theater headquarters and unified command headquarters and at each land force level down to and including division, and in the appropriate sections at the brigade and battalion task force level. These staff officers are specially trained in the technical aspects of the tactical employment of ADM, and make the necessary target analysis and staff recommendations inherent to their use. In addition, qualified officers and enlisted personnel are assigned to armored and mechanized division engineer battalions and corps engineer combat groups, thus enabling these subordinate units to make specific recommendations to higher headquarters relative to an ADM mission concerning either the assembly or the effects.
- (2) *Special staff.* Certain special staff officers furnish the commander information and intelligence as pertains to

their related fields. The engineer staff officer performs the following:

- (a) Participates in the target analysis for employment of the ADM in coordination with the operations officer, chemical officer, and the artillery officer. The elements of an ADM target analysis are discussed in (S) FM 5-26.
- (b) Based on the target analysis and the commander's guidance prepares the ADM plan in coordination with the operations officer. (Contents of a classified ADM plan are contained in (S) FM 5-26.)
- (c) Coordinates with the appropriate staff officers pertaining to availability of ADM's; location of special ammunition supply points; and issue, transport, communications, and security of ADM's.
- (d) Advises the tactical commander relative to designation of the engineer delivery unit to execute the technical requirements of the ADM mission.
- (e) Maintains close contact with the intelligence officer and chemical officer relative to current meteorological conditions and probable residual radiation effects resulting from the ADM detonation.

5. Actions of the Immediate Tactical Commander

a. The tactical commander, after deciding to employ an ADM, has the following responsibilities:

- (1) Selects the desired yield.
- (2) Selects the location of the emplacement site.
- (3) Prepares the "reserved demolition" orders (inclosures 1 and 2).
- (4) Coordinates the movement of the ADM from the special ammunition supply point (SASP) to emplacement site.
- (5) Coordinates the detonation of the ADM with the overall plan of maneuver.
- (6) Designates the tactical unit that will provide security of the ADM.

- (7) Establishes positive command control for communications, including remote command firing of the munition.
- (8) Selects method and time of firing (that is, timer or remote command).
- (9) Establishes liaison with the engineer delivery unit at emplacement site or rendezvous point, and operationally controls it until the mission is accomplished.
- (10) Establishes percent of damage desired and designates a nuclear safety line.
- (11) Evacuates friendly civilians, if necessary.
- (12) Informs higher, lower, and adjacent units of the proposed detonation.

b. Throughout the above actions, the commander reports to his immediate commander on mission progress.

6. Actions of the Engineer Delivery Unit

a. The engineer delivery unit has the following responsibilities:

- (1) Picks up, on order, the desired ADM from the special ammunition supply point.
- (2) Transports and provides movement security for the ADM.
- (3) Prepares the emplacement site and remote command sites.
- (4) Installs obstacles, including protective minefields, around the emplacement site and remote command sites.
- (5) Installs the ADM at emplacement site.
- (6) Installs remote command equipment at remote command site.
- (7) Camouflage sites.
- (8) Prepares the ADM for detonation.
- (9) Provides immediate security of emplacement site and remote control site.
- (10) Fires (detonates) the munition when ordered, by procedures established in the "reserved demolition" orders.
- (11) Establishes and maintains communications as directed.
- (12) Recovers the munition, if so ordered.

b. Throughout the entire operation, the senior engineer representative reports technical progress to the tactical commander assigned the mission.

7. Orders for Firing

a. General. There are normally three commanders involved in the execution of an ADM. They are—

- (1) The military authority (authorized commander) who has overall responsibility and is empowered to order the firing of the ADM.
- (2) The commander of the demolition (ADM) guard.
- (3) The commander of the demolition (ADM) firing party.

Note. To assist the commanders in the execution of their responsibilities, two demolition orders are used. They are the orders to the demolition guard commander and the orders to the commander, demolition firing party.

b. Procedures. Each authorized commander, the military authority referred to above, will—

- (1) Establish the requirement and allot the responsibility for a demolition (ADM) guard and a demolition (ADM) firing party.
- (2) Establish a clear-cut channel whereby the order to fire the ADM is transmitted from himself to the commander of the demolition (ADM) guard and

thereby to the commander of the demolition (ADM) firing party.

- (3) Insure that this channel is known and understood by all concerned, and that positive secure means for transmitting the order to fire are established.
- (4) Specify the conditions for executing the demolition by completing part V of "Orders to the Commander, Demolition (ADM) Firing Party," and part IV of the "Orders to the Demolition (ADM) Guard Commander."

c. Orders to the Demolition (ADM) Guard Commander. The authorized commander completes and signs this order. The order is written in seven parts, each of which is self-explanatory (inclosure 1).

d. Orders to the Commander, Demolition (ADM) Firing Party. This order provides the officer in charge of the demolition (ADM) firing party, who would normally be the senior engineer, with explicit, instructions relative to pickup, transport, security, emplacement, and firing of the ADM. It is similar to the demolition order (DA Form 2050-R) issued for a "reserved demolition" amended for use with nuclear munitions (inclosure 2). (Samples of the classified version of these orders are contained in (S) (FM 5-26.)

INCLOSURE 1 EXAMPLE OF ORDERS TO DEMOLITION GUARD COMMANDER

(Classification)

Serial No. 25-ADM-13 Security Classification (Example)

ORDERS TO THE DEMOLITION GUARD COMMANDER

- Notes.
1. This order will be completed and signed before it is handed to the Commander of the Demolition Guard.
 2. In completing the order, all spaces must either be filled in or lined out.
 3. The officer empowered to order the firing of the demolition is referred to throughout as the "Authorized Commander".

From CO. TF 2/13 Armor To CO, Tm A, TF 2/13 Armor

PART I—PRELIMINARY INSTRUCTIONS

1. a. Description of target Highway Bridge across Main River
 b. Location: vic GROSSAUHEIM, Germany
Map Name and Scale Frankfurt am Main-Ost, 1:50000 Sheet
No. L5918
Grid Reference MA 956507
 c. Codeword or codesign (if any) of demolition target. Poor Boy
 d. ADM Type and Yield. ALFA 0.5 KT.
 e. Emplacement. Surface type located in demolition chamber of the southwest bridge abutment. Sandbags will be placed in front of chamber door to afford additional small-arms fire protection.
 f. Camouflage. Prepare and implement track plan. Minimum number of personnel and vehicles permitted at emplacement site. Deploy security elements to preclude drawing attention to site.
 g. Remote Command Site. Prepare a remote command site vicinity of church located in Steinheim am Main (MA938506).
 h. Timer Mechanism. Maximum time will be set on the timer mechanism.
 i. Communications. Maintain two radio sets in TF command net at all times.
 j. Reports. State of readiness progress reports each 30 minutes.
 k. Command Representation. One of the following officers will be at the emplacement site during emplacement and then at the remote command site:
- | <u>Grade</u> | <u>Name</u> | <u>Position</u> |
|--------------|-----------------------|--|
| Captain | Romero D. Sickles III | CO, Tm A, 2/13 Armor
(Demolition Guard) |
| Lieutenant | Harry B. Belford | XO, above team. |
2. The Authorized Commander is Lt Col James E. Foster
 (give appointment only). If this officer should delegate his authority you will be notified by one of the methods shown in 4, below.

(Classification)

(Classification)

3. The DEMOLITION FIRING PARTY will be provided by -----
1st Platoon, Co B, 25th Engr Bn
4. All messages, including any codewords or codesign (if any) used in these orders, will be passed to you by:
 - a. Normal command wireless net, or
 - b. Special liaison officer with communications direct to the Authorized commander, or
 - c. The Authorized Commander personally, or
 - d. (No other means)

(Delete those NOT applicable)

Note. All orders sent by message will be prefixed by the codeword or codesign (if any) at 1c above, and all such messages must be acknowledged.

PART II—CHANGING STATES OF READINESS .

5. The demolition will be prepared initially to the State of Readiness
2 (Armed) by 0630 hours on 18 Dec 1961 (date).
6. On arrival at the demolition site, you will ascertain from the commander of the demolition firing party the estimated time required to change from State "1" (SAFE) to State "2" (ARMED). You will insure that this information is passed to the Authorized Commander and is acknowledged.
7. Changes in the State of Readiness from State "1" (SAFE) to State "2" (ARMED) or from State "2" to State "1" will be made only when so ordered by the Authorized Commander. However, the demolition may be ARMED in order to accomplish emergency firing when you are authorized to fire it on your own initiative.
8. A record of the changes in the State of Readiness will be entered by you in the table below, and on the firing orders in possession of the commander of the demolition firing party.

State of Readiness ordered "1" (SAFE) or "2" (ARMED)	Time & date change to be completed	Authority	Time & date of receipt of order

Note. If the order is transmitted by an officer in person, his signature and designation will be obtained in the column headed "Authority."

9. You will report completion of all changes in the State of Readiness to the Authorized Commander by the quickest means.

PART III—ORDERS FOR FIRING THE DEMOLITION

10. The order for firing the demolition will be passed to you by the Authorized Commander.

(Classification)

(Classification)

11. On receipt of this order you will immediately pass it to the commander of the demolition firing party on his demolition orders ("Orders to the Commander of the Demolition Firing Party").
12. After the demolition has been fired you will report the results immediately to the Authorized Commander.
13. In the event of a misfire or only partially successful demolition you will give the firing party protection until such time as it has completed the demolition and report again after it has been completed.

PART IV—EMERGENCY FIRING ORDERSNotes. 1. One subparagraph of paragraph 14 must be deleted.

2. The order given herein can only be altered by the issue of a new order, or, in emergency by the appropriate order (or codeword if used) in Part V.

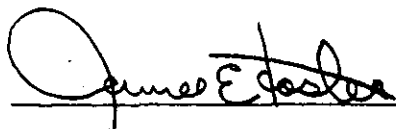
14. a. You will order the firing of the demolition only upon the order of the Authorized Commander.

OR

- b. If the enemy is in the act of capturing the target you will order the firing of the demolition on your own initiative.

PART V—CODEWORD (IF USED)

	Action to be taken	Codeword (if used)
a.	Change State of Readiness from "1" to "2" (see par. 7).	PLUM
b.	Change State of Readiness from "2" to "1" (see par. 7).	APPLE
c.	Fire the demolition (see par. 10).	SUNFLOWER
d.	Paragraph 14a is now canceled. You are now authorized to fire the demolition if the enemy is in the act of capturing it.	MAPLE
e.	Paragraph 14b is now canceled. You will order the firing of the demolition only upon the order of the Authorized Commander.	-----
f.	Special authentication instructions, if any.	-----

PART VI


Signature of officer issuing these orders

Name (Printed in capital letters) JAMES E. FOSTER
 Rank Lt Col Appointment CO, 2/13 Armor
 Time of issue 0930 hours, 14 December 1961 (date).

(Classification)

(Classification)

PART VII—DUTIES OF THE COMMANDER OF
THE DEMOLITION GUARD

15. You are responsible for—
 - a. Command of the demolition guard and the demolition firing party.
 - b. The safety of the demolition from enemy attack or sabotage.
 - c. Control of traffic and refugees.
 - d. Giving the orders to the demolition firing party in writing to change the state of readiness.
 - e. Giving the order to the demolition firing party in writing to fire the demolition.
 - f. After the demolition, reporting on its effectiveness to the Authorized Commander.
 - g. Keeping the Authorized Commander informed of the operational situation at the demolition site.
16. You will acquaint yourself with the orders issued to the Commander of the Demolition Firing Party and with the instructions given by him.
17. The Demolition Guard will be so disposed as to insure at all times complete all-round protection of the demolition against all types of attack or threat.
18. The Commander of the Demolition Firing Party is in technical control of the demolition. You will agree with him the site of your HQ and of the firing point. These should be together whenever practicable. When siting them you must give weight to the technical requirements of being able to view the demolition and have good access to it from the firing point.
19. You will nominate your deputy forthwith and compile a seniority roster. You will insure that each man knows his place in the roster, understands his duties and knows where to find this order if you become a casualty or are unavoidably absent. The seniority roster must be made known to the Commander of the Demolition Firing Party.
20. Once the state of readiness "2 ARMED" has been ordered, either you or your deputy must always be at your HQ so that orders can be passed on immediately to the Commander of the Demolition Firing Party.

(Classification)

INCLOSURE 2
DA FORM 2050-R, ORDERS TO THE COMMANDER,
DEMOLITION FIRING PARTY

SECURITY CLASSIFICATION			
ORDERS TO THE COMMANDER, DEMOLITION FIRING PARTY			SERIAL NO 25-AMD-13
NOTES:--Parts I, II and III will be completed and signed before this form is handed to the commander of the Demolition Firing Party. Parts 4 and 5 can only be altered by the authority issuing these orders. In such cases a new form will be issued and the old one destroyed.			
FROM: CO TF 2/13 Armor		TO: CO 1st Platoon, Co B 25th Engr Bn	
PART I--ORDERS FOR PREPARING AND CHARGING THE DEMOLITION TARGET			
1a. DESCRIPTION Highway bridge across main river vic Grossanhein, Germany.			
b. LOCATION		c. CODE WORD OF DEMOLITION TARGET (if any).	
MAP NAME AND SCALE Frankfurt am Main-Ost 1:50,000	SHEET NO L5918	GRID REFERENCE MA956507	POOR BOY
d. ATTACHED PHOTOGRAPHS AND SPECIAL TECHNICAL INSTRUCTIONS See attached.			
2. THE DEMOLITION GUARD IS BEING PROVIDED BY (Unit) <u>Im A, TF 2/13 Armor</u>			
3. YOU WILL PREPARE AND CHARGE THE DEMOLITION TARGET TO THE STATE OF READINESS <u>2 (Armed)</u> BY <u>C63C</u> HOURS ON <u>18 Dec 1961</u> (date). ANY CHANGES MAY ONLY BE MADE ON THE ORDER OF THE ISSUING AUTHORITY, OR BY THE OFFICER DESIGNATED IN PAR 4d AND WILL BE RECORDED BELOW.			
STATE OF READINESS ORDERED "1(SAFE)" OR "2(ARMED)"	TIME AND DATA CHANGE TO BE COMPLETED	AUTHORITY	TIME AND DATE OF RECEIPT OF ORDER
NOTE:--All orders received by message will be verified by the code word of par 1c. If the order is transmitted by an officer in person, his signature and designation will be obtained in the column headed "Authority."			
PART II--ORDERS FOR FIRING			
NOTE:--The officer issuing these orders will strike out the subparagraph of pars 4 and 5 which are not applicable. When there is a demolition guard subparagraph 4d will always be used, and par 5 will always be struck out.			
4a. YOU WILL FIRE THE DEMOLITION AT XXXXX AS YOU HAVE PREPARED IT			
b. YOU WILL FIRE THE DEMOLITION AT XXXXXXXXXXXXXXXXXXXX HOURS ON XXXXXXXXXXXXXXXXXXXX DATE.			
c. YOU WILL FIRE THE DEMOLITION ON RECEIPT OF THE CODE WORD XXXXXXXXXXXXXXXXXXXXXXXXXX.			
d. YOU WILL FIRE THE DEMOLITION WHEN THE OFFICER WHOSE DESIGNATION IS <u>CO, Im A, TF 2/13 Armor</u> HAS SIGNED PAR 8 BELOW.			
EXERCISE FIRE ON ORDERS ONLY and delete when there is no demolition guard.			
5. YOU WILL NOT FIRE THE DEMOLITION UNLESS IT IS REQUESTED BY THE OFFICER IN PAR 4d ABOVE OR YOU WILL FIRE THE DEMOLITION ON YOUR OWN INITIATIVE IF THE ENEMY IS IN THE ACT OF CAPTURING IT.			

DA FORM 2050-R, 1 NOV 57

SECURITY CLASSIFICATION

Figure 81. DA Form 2050-R.

APPENDIX XXII

EMPLOYMENT OF GROUND SURVEILLANCE RADAR

1. Introduction

a. Ground surveillance radar equipment provides the armor unit with an all-weather capability for battlefield surveillance. This equipment complements other combat surveillance and target acquisition means in the battalion. Its employment is coordinated closely with the employment of patrols, listening posts, observation posts, and with infrared and other sensory devices. Ground surveillance radar can provide observation from a given vantage point 24 hours a day and can detect targets and provide a much more accurate range and azimuth reading than is possible in eye estimation. By using this all-weather, 24-hour capability inherent in ground surveillance radar equipment, the unit commander can increase appreciably the effective use of fire support means.

b. Although the radar equipment is an excellent means of obtaining information, it does not replace other surveillance means. Its primary advantage is its ability to complement other means and to detect information with accuracy when other surveillance means cannot. Radar is used primarily for operations at night or under conditions of poor visibility (haze, fog, or smoke); radar equipment may be used effectively during periods of good visibility. The employment of this equipment should not be restricted to a certain type of terrain, a rigid set of conditions, or to a few functional operations.

2. Types of Radar Equipment

The two general types of ground surveillance radar equipment found in an armor ground unit are—

a. Short range radar organic to company-size units.

b. Medium range radar organic to battalion-size units.

3. Capabilities and Limitations

a. Radar energy produced by ground surveillance equipment can penetrate light camouflage, smoke, haze, light rain, light snow, darkness and light foliage to detect targets; it will not penetrate dense undergrowth, trees, and heavy foliage. Heavy rain or snow seriously restrict radar detection capabilities. Radar sets have a *line-of-sight* capability.

b. Ground surveillance radar is generally ineffective against air targets unless the air target is flying close to the ground to permit background echos. The radar is vulnerable to jamming and electronic and other deception means.

4. Definitions

a. *Search*. To systematically inspect an area by range scan, azimuth scan, elevation scan, or a combination of the three.

b. *Range scan*. A method of search in which a specific area (fixed by width of beam) is inspected in range by the range gate.

c. *Azimuth scan*. A method of search in which a specific area is inspected in azimuth by moving the radar set in azimuth throughout the area to be searched.

d. *Elevation scan*. A method of search in which a specific area is inspected in elevation by moving the radar set in elevation throughout the area to be searched.

e. *Strobing*. The automatic scanning of a given range segment by a range gate.

f. *Range gate*. An increment of distance in which targets can be detected.

g. *Monitor*. To inspect and maintain surveillance of a specific point of interest or, a number of points, for a given length of time.

5. Training

a. In the training of radar operators practical work performed by the operator must be

emphasized. Through practice under all conditions of weather, terrain, and visibility, the operator can reach peak proficiency in the identification of moving objectives as military targets versus other moving objects such as animals. Guidance for the training of ground surveillance radar operators is contained in ASubjScd 17-133.

b. All commanders and other key personnel should be familiar with the capabilities, limitations, and methods of employment of ground surveillance radars. Periodic refresher training of these personnel should be conducted to insure a high level of knowledge of the radar equipment. Whenever possible, employment of radar equipment should be integrated into field exercises and other tactical training.

6. Tactical Employment

Ground surveillance radar may be employed in all types of tactical operations. Types of surveillance employed by radar personnel are search and monitor. It is capable of performing a variety of tasks, including—

a. *Searching* avenues of approach, possible enemy attack positions, assembly areas, or other sectors or areas on a time schedule, at random, or continuously to report location, size, compositions, and nature of enemy activity.

b. *Monitoring* point targets such as bridges, defiles, or road junctions and reporting quantity, type of target, and direction of movement through the point.

c. *Monitoring and searching* final protective fire areas or barrage locations to permit timely firing.

d. *Searching* areas of nuclear and conventional fires to detect enemy activity immediately after firing as an indication of firing effect.

e. *Extending* the observation capabilities of patrols by enabling them to survey distant points or areas of special interest.

f. *Assisting* the visual observation of units during daylight hours by making initial detection of partially obscured (haze) targets at long ranges.

g. *Assisting* in the control of units during limited visibility operations.

h. *Increasing* the effectiveness of fire support. When targets have been detected with reasonable certainty by radar, the fire support means may immediately take the target under fire. If the type of target cannot be established definitely, the radar team can furnish location information of the target so that illumination may then be employed accurately to establish which type of fire can be used best. Since well-trained radar operators can estimate the density of enemy activity in a given area and the rate of enemy movement, radar equipment may be used to assist in determining the optimum weapons system for employment.

i. *Determining* rate of movement of a target by plotting the location of the target at two known points and the time it took the target to move from one point to the other.

7. Radar Surveillance Cards

To insure proper surveillance coverage of the battalion area, in relatively static situations, subordinate units will normally submit overlays to battalion indicating the area of coverage of organic or attached surveillance means. Radar surveillance cards (fig. 82) will assist commanders in preparation of these overlays. Cards will normally be prepared by the senior radar operator immediately after the equipment is placed in position. Information from these cards will be distributed to appropriate fire support agencies. Radar surveillance cards are prepared for primary (P), alternate (A), and supplementary (S) positions. Coordinates for the radar positions are noted as accurately as possible. The type radar employed is also designated on the radar surveillance card.

8. Selection of Radar Sites

The specific location of the radar equipment site is normally selected by the ground surveillance section or squad leader. The specific location must be in the general location designated by the unit commander and meet the criteria of a position for a crew-served weapon. Primary, alternate, and supplemental positions should be selected and prepared if time per-

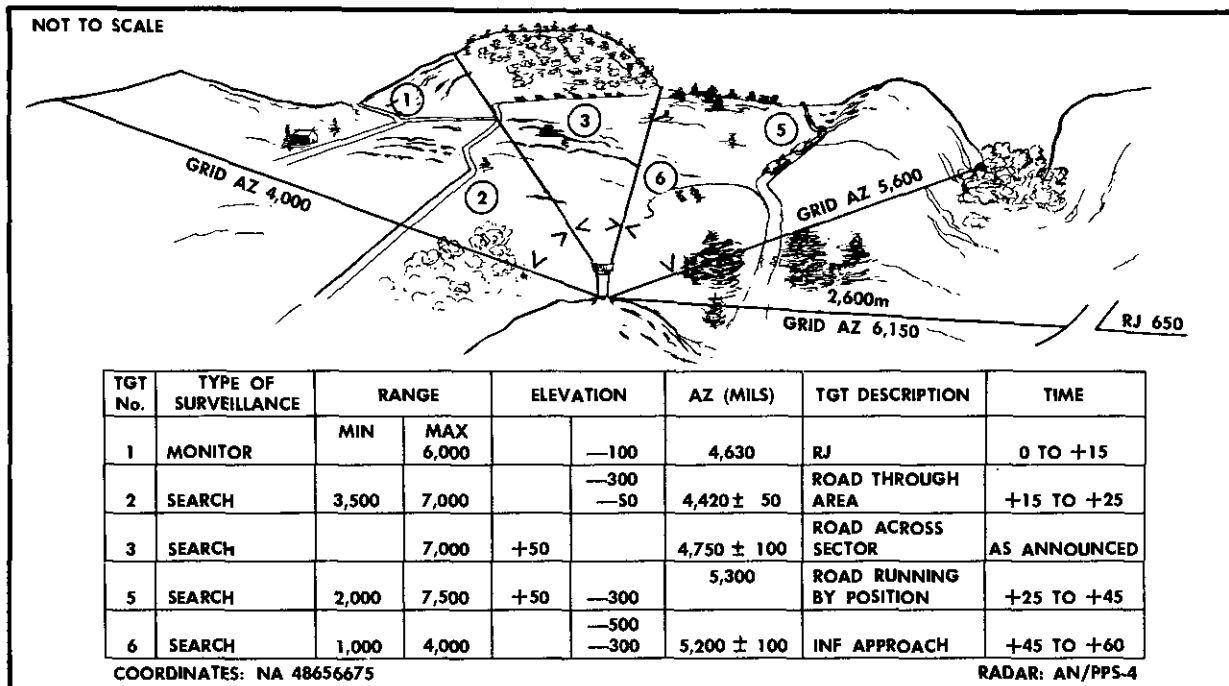


Figure 82. Radar surveillance card (AN/PPS-4).

mits. The radar site should have as many of the following characteristics as possible:

- Permit maximum radar coverage of the assigned area.
- Provide concealment for the team vehicle and equipment.
- Facilitate communications.
- Take advantage of routes for displacement.
- Located in areas relatively free of close ground clutter such as trees, bushes, or buildings. If these objects are directly in the radar beam, the resulting clutter tends to distort the radar beam resulting in inaccurate range, azimuth, and elevation data.
- Advantage should be taken of security provided by combat elements while avoiding interference with their operations. If possible, a position should be selected within a well-defended area; however, since the enemy may be capable of detecting radar signals and firing in that area, locating radar equipment in the immediate vicinity of troop dispositions or key installations may be undesirable. The factors

of METT must be considered in positioning radar equipment.

9. Positioning of Equipment

Radars are normally positioned on the forward slopes of dominating terrain (military crest). A radar site and an observation post may be located together; however, radar personnel should not be detailed as ground observers except in emergencies. To take advantage of the maximum range of the set, radars are employed as far forward as possible. As with a crew-served weapon, radar equipment is dug in and camouflaged, consistent with the requirements for operating the equipment. It is positioned so that its employment is coordinated closely with the disposition and employment of other surveillance means.

10. Orientation of the Radar Site

- After the site is occupied, the radar set is oriented immediately and placed in operation. A radar surveillance card is then prepared and the site is improved. The set must be oriented in azimuth and range and its position must be accurately plotted on a map before the operator

can pinpoint targets geographically. Location of the radar site may be accomplished by survey, resection, or intersection.

b. If the set is properly oriented and coordination with fire support elements is effected, targets detected by radar can be taken under fire using preplanned concentrations. Orientation and coordination of surveillance areas should be accomplished during daylight hours. In some instances it may be more desirable to move radars into previously prepared positions under cover of darkness or poor visibility.

11. Operation of Equipment

a. Each radar team/squad is assigned specific surveillance missions. In assigning missions, consideration is given to terrain, enemy capabilities, equipment capabilities, and desired degree of surveillance overlap. Sector surveillance assignments, type of surveillance to be conducted (search or monitor), *how and when* information is to be reported, and frequency of coverage must be included in instructions to the radar team/squad.

b. If enemy activity is detected in an area not included in the surveillance plan, new missions may be prescribed redirecting the efforts of the radars to meet changes in the tactical situation. The radar should be operated at irregular intervals to provide some security from detection and subsequent enemy jamming.

12. Reporting Information

Ground radar surveillance reporting procedures should be incorporated in the unit SOP. Depending upon the specific requirements, positive and negative information obtained by the radar will be reported by the operator immediately or at prescribed intervals. The operator will transmit the information in spot report format by using range and azimuth, coordinates, or distance from a known reference point of the activity located. For security reasons, the use of coordinates is preferred. He will also state what he determines the target to be, for example, dismounted personnel, or wheel or tracked vehicles. The specific reporting details will be prescribed by the commander when assigning surveillance missions to the radar team. The requirement for immediate

reporting of enemy activity or cessation of activity, must be stressed at all echelons. Reporting is through command channels unless specified otherwise.

13. Alternate and Supplementary Positions

Alternate and supplementary positions are selected and prepared as time permits. When the mission cannot be accomplished from the primary position, the senior radar operator may *displace* the equipment to an alternate position. Before moving to an alternate position, the section leader or unit commander is notified. Moving to supplementary positions is accomplished only on order of the section leader or unit commander.

14. The Offense

There will be many opportunities for the employment of radar in offensive action. Commanders should be alert to these situations and capitalize on the capabilities of the ground radar. Highly mobile, fast-moving operations may preclude the continuous and effective use of radar.

15. Advance to Contact

During the advance to contact, radar may be employed with reconnaissance and security elements on an exposed flank or to provide additional observation and security. To provide continuous flank surveillance, it may become necessary to employ teams in pairs and move them by bounds.

16. Penetration

a. Radar may be employed profitably in a penetration. It may locate enemy defenses before the attack to the extent that the attacking commander may avoid enemy strengths and capitalize on enemy defensive weaknesses discovered by radar and other surveillance means.

b. Once contact has been established, radar may be used to provide surveillance forward of the line of contact or on an exposed flank. It may be positioned to provide surveillance over critical areas or on avenues of approach. Radar teams may locate enemy activity to facilitate use of preparatory fires and may survey enemy positions to establish whether there is any rein-

forcement, shifting, or withdrawal of enemy units just before the attack. To accomplish this the normal movement pattern of the enemy position must be established.

c. During darkness or poor visibility, radar *may be employed* to vector or guide friendly attacking elements. It may be used in tracing the movement of forward friendly units to establish and confirm their specific location at any given time and to coordinate supporting fires with the advance of friendly elements. To facilitate location of friendly elements, conventional communication means and a pattern of signals may be established to assist the operator in identification. These signals may consist of swinging a canteen or helmet in rotary fashion, using a reflector or using any pattern of movement that can be identified readily by the operator of the radar equipment.

17. Infiltration

a. Infiltration may be used within or to affect the penetration. When gaps in enemy defenses have been located, attacking elements may infiltrate through the enemy position. Radar teams may be employed effectively in conjunction with infiltration by surveying infiltration lanes for enemy activity and determining the progress of infiltrating units.

b. Short range radar teams may be employed with infiltrating units in the enemy rear area. Use of a team by infiltrating elements may enable these elements to locate enemy activity and avoid discovery. Conversely, radar emissions may, in certain circumstances, compromise the location of friendly units. The determination of whether radar teams should be employed by an infiltrating element will generally depend upon the urgency of obtaining information of the enemy in the area as opposed to the need for avoiding discovery. If radar is employed with infiltrating elements, it may be used also to facilitate linkup with attacking forces.

18. Envelopment

In the envelopment, radar may be able to detect large gaps or assailable flanks that can help to hasten the operations. It may be possible to employ the radar with security elements

of the enveloping force to provide early warning of enemy activity.

19. Displacement

a. Radars should be kept as far forward as the tactical situation and terrain will permit. Teams displace to support a continuation of the attack or when they can no longer provide effective support for a unit making the attack. Displacement may be required also to support the consolidation on the objective. For this reason displacement should not be delayed arbitrarily until the teams can no longer provide effective support. The commander must weigh the immediate loss of a surveillance capability against the requirement for immediate surveillance during the consolidation.

b. Displacement should be accomplished so that teams are in position on the objective immediately following its seizure. Timely displacement will enable forward units to continue destructive fire on withdrawing enemy units or to detect enemy activity indicating a counterattack. Whenever feasible, teams displace by bounds so that some radar surveillance means are available at any given time.

20. Consolidation and Reorganization

Radar teams displace on order to positions selected previously by a visual or map reconnaissance. During the consolidation and reorganization, primary emphasis is placed on immediately placing the equipment in operation to obtain information on the enemy. Thereafter, positions are improved and equipment is dug in and camouflaged as the situation permits. Since the radar teams on the objective will be surveying the area beyond the objective, they must be informed fully of friendly patrols and other elements set forward to maintain contact with the enemy.

21. Exploitation or Pursuit

a. In the exploitation or pursuit, radar teams are employed essentially as they are in the advance to contact. They may be employed with security elements to provide surveillance on an exposed flank or may provide observation and security. Radar teams may be moved by bounds with rapidly advancing elements to pro-

vide information of enemy activity. By detecting the presence or lack of enemy activity in an area, the ground surveillance may speed up exploitation operations.

b. Radar teams attached to an enveloping force may be sited to locate withdrawing enemy elements and to facilitate their destruction. Radar may be used in conjunction with other communication means to identify friendly units to facilitate the linkup with friendly elements.

22. River Crossing Operations

Radars are used in a river crossing as in normal offensive operations. Radars placed on dominating terrain on the near bank may determine the progress of friendly units on the far bank. When smoke is used by friendly forces engaged in a river crossing, radar may be used to detect enemy troop activity on the far bank including withdrawal, reinforcement, or shifting of units.

23. Defense

In the defense, the radars are employed to maintain surveillance over avenues of approach, possible enemy attack positions, and assembly areas. The surveillance effort is directed not only forward of the FEBA, but also used by units throughout the battle area. Particular attention is given to gaps between units, exposed flanks, possible helicopter or parachute landing zones in the battle area, and other critical areas. To this end, alternate and supplementary positions for radar teams are established to provide complete surveillance coverage of the battle area.

24. Employment in the Defense

a. Radar may support 1 echelon or any combination of the 3 echelons of defense. It may be employed with the security forces to extend their surveillance capability. Teams employed with the security force normally revert to their primary mission when the security force is withdrawn.

b. The uses of radar in the defense are limited only by the capabilities of the equipment and the imagination and ingenuity of the tactical commander. Radar teams may be employed

in conjunction with barrages and final protective fires by determining when the enemy approaches or is located in these areas. Radars may be used in conjunction with emplaced anti-personnel weapons in determining when such weapons can be detonated best. They may be used to determine the optimum time for detonation of explosives, chemicals, or nuclear demolition munitions.

c. Since the enemy may often attack at night, during poor visibility, or with use of heavy smoke screens, radar will be of great use in defensive operations. When an enemy attacks on a broad front, the amount of enemy activity in a given area may indicate the possible location of the enemy main effort. When radar sightings are used in conjunction with knowledge of enemy tactics, specific enemy maneuvers may be anticipated. Radar sightings may be used to establish the depth of the enemy offensive effort and to indicate whether a feint or demonstration is being conducted in the area.

25. Ambushes

Radar teams may locate enemy patrols moving toward friendly defensive positions and thereby allow friendly units to ambush such patrols and take prisoners.

26. Action During a Counterattack

During a counterattack, radar teams will continue to report information of enemy activity. In the counterattack, radars may be used to gain information for the commander of the strength and depth of the enemy penetration. Teams employed with forward companies in or adjacent to an enemy penetration may shift their area of surveillance on order to the area of penetration to provide the commander with this information.

27. Retrograde Operations

a. In retrograde operations radar is used primarily for early warning. It is employed with security elements to cover avenues of approach, flanks, and the rear of a unit.

b. By use of ground surveillance radar, the commander may obtain additional information of the enemy strength in the area. Based upon

this information and information obtained from other sources, he is in a better position to plan the conduct of his operations.

28. Movement to Subsequent Positions

a. The decision when to displace radar equipment involves many factors. In most retrograde operations, secrecy will be a primary consideration. Since radar emissions may be detected by the enemy, any premature displacement of radar equipment may compromise this secrecy. The commander must consider also the amount of time required to take the equipment out of action.

b. With these and other considerations, the commander must weigh the requirement for maintaining surveillance equipment on position as long as practicable. Radars may aid in the effective delay of the enemy by providing early warning of the direction and size of his movement. Premature displacement of radar teams should be avoided.

c. Radar may be employed with security elements to overwatch movement of friendly units to the rear. Radar may be employed to assist in maintaining contact with the enemy and to determine the extent of aggressiveness of the enemy pursuit.

APPENDIX XXIII

PREDICTION OF FALLOUT AND CHEMICAL AND RADIOLOGICAL
MONITORING AND SURVEY

Section I. FALLOUT PREDICTION

1. General

Two methods of fallout prediction are available for use in the field, the detailed method and the simplified method. The detailed method involves the preparation of a fallout wind vector plot each time new meteorological data is received (normally every 2 hours). Effective wind speed, wind direction, and width of the predicted zones are determined from the fallout wind vector plot. Effective wind speed and direction are transmitted to subordinate units to enable the commanders to make a simplified prediction. The simplified prediction affords the subordinate commands a direct and immediately usable method to estimate the fallout hazard with the least possible delay. Normally the detailed procedure will be used at echelons having a meteorological capability and the simplified procedure will be used at other echelons. The decision as to which procedure to use at various echelons is left to the commanders concerned.

2. Purpose

Both the detailed and the simplified predictions produce the same end product—a plot of predicted zones that are expected to contain dangerous fallout contamination (fig. 83). These zones are described as follows:

a. *Zone I, "Zone of Immediate Operational Concern."* The general area in which exposed, unprotected troops may receive casualty-producing doses (greater than 100 rad) in relatively short periods of times (less than 4 hours

after onset of fallout). *Major disruption of unit operations is expected to occur in this zone.*

b. *Zone II, "Zone of Moderate Risk."* The general area in which exposed, unprotected personnel are expected to receive a total dose of not more than 100 rad when remaining in the area for not more than 4 hours *after* onset of fallout. Troops in zone II may continue their missions without casualties for up to 4 hours *after* onset of fallout provided they have not been exposed to radiation previously.

c. *Outside Zones I and II.* No casualties are anticipated, outside these two areas and doses are not expected to exceed 20 rad in the first 6 hours *after* onset of fallout. The total dose for an infinite stay outside zones I and II should not exceed 150 rad.

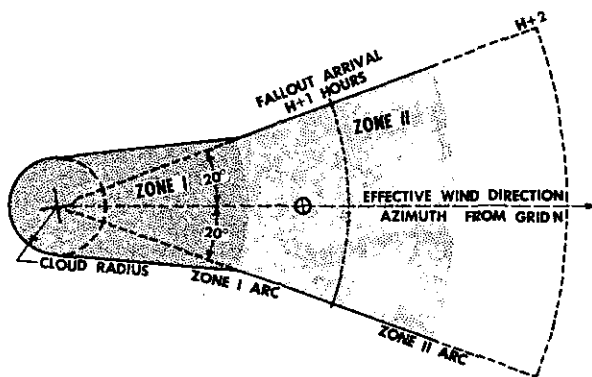


Figure 83. Fallout prediction plot.

Section II. FIELD EXPEDIENT METHODS FOR ESTIMATION OF NUCLEAR BURST YIELD

3. General

After a nuclear burst certain measurements must be observed and reported to provide a means of determining location of ground zero and estimating the yield. Units in the vicinity of the burst, but outside the zone of primary effects, will measure and report to their next higher headquarters burst observations.

4. Description of Terms

a. Flash-to-Bang Time. This is the time interval in seconds between the "chalkwhite flash" of the detonation and the arrival of the sound of the explosion at the position of the observer. This measurement establishes the distance from the observer to ground zero. The shock wave (sound of the explosion) travels at an average velocity of 350 meters per second. To determine the distance in meters from the observer to ground zero (GZ), multiply the flash-to-bang time in seconds by 350 meters.

b. Width of the Fireball. This is the angle in mills subtended by the fireball and measured by an observer immediately after the passage of the shock wave.

(1) In the field, this measurement is made by the observer taking cover on noting the flash, and counting the seconds until the explosion is heard (flash-to-bang time); he then measures the fireball width by available means. At this time there is no danger to the eyes from the fireball luminescence. It is important that the measurement be made immediately after the passage of the shock wave, because the rapid expansion of the fireball would cause a late reading to be in error.

(2) The fireball will vary in appearance, depending on the yield and the distance of the observer from GZ. The appearance may vary from a hot, radiant ball of fire at early times, to a barely luminous, generally spherical cloud at later times.

c. Azimuth Measurement. Azimuth from the observer to the mushroom stem is measured

and reported to assist higher headquarters in locating ground zero of the burst, by means of several intersecting azimuths.

d. Cloud Angles.

(1) Cloudtop angle is the vertical angle in mills or degrees subtended by horizontal plane and the top of the mushroom cloud, measured at approximately 10 minutes after the burst. At this time the cloud has stabilized in height (fig. 84).

(2) Cloudbottom angle is the vertical angle in mills or degrees subtended by a horizontal plane and the point of intersection of the mushroom cloud and the stem, measured at approximately 10 minutes after the burst (fig. 84).

e. Height of Burst. This is the position of the explosion relative to the surface (earth or water). The exact, height of burst of enemy-delivered weapons is desirable to know, but may be virtually impossible to ascertain with present observational techniques. The trained observer can, however, discriminate between the obvious airburst and the contact surface burst, leaving the transition zone as an area of doubt to be resolved by other means, such as the presence or the absence of a crater.

f. Cloud Diameter. There may be instances where it is not possible to distinguish clearly the cloudtop height or cloudbottom height. In such cases, if a clear measurement of cloud diameter is possible at time of stabilization (H+ 10 minutes) this measurement, in mills or degrees together with the observer location, should be reported through command channels to the CBRE for use in yield determination (fig. 84).

g. Ground Zero. This is the point on the ground at or above which the nuclear explosion occurs. The location of GZ can be determined either by intersecting azimuths (*c* above), or by flash-to-bang time (*a* above).

5. Nuclear Burst Information

a. There are certain requirements for observed data on nuclear bursts.

(1) *Primary.* Every effort should be made to obtain the following:

- (a) Height of the bottom of the cloud (intersection of the stem and bottom of the cloud) at the time it reaches its maximum altitude (approximately 10 minutes after detonation) (fig. 84).
- (b) Ground zero location (by intersecting azimuths, flash-bang-time, sound ranging, or radar).

(2) *Secondary.* Efforts should be directed toward measuring the following parameters, in addition to the height of the bottom of the cloud—

- (a) Height of the top of cloud at the time it reaches its maximum altitude (approximately 10 minutes after detonation) (fig. 84).
- (b) Cloud diameter at 10 minutes after detonation (fig. 84).
- (c) Height of burst—whether an obvious airburst or surface burst.

b. All units with optical equipment will orient their instruments on the site of the burst. A reading to the center of the stem is taken

as soon as feasible after detonation to determine ground zero. Readings of elevation to the intersection of the stem and cloud bottom, elevation to the top of the cloud, and the azimuths to the edges of the cloud at its widest points are taken at 10 minutes after detonation. In the absence of instruments, individuals will use field expedient methods for determining these measurements. Information outlined is submitted to the next higher headquarters by the most expeditious means.

6. Field Expedient Measurement of Angles

When optical instruments are not available for measurement of angles required for the determination of burst parameters these angles can be estimated in mils by the observer holding his arm fully extended and measuring the angle in terms of a number of fingers (30 mils each), or fist (180 mils), or fingers spread (300 mils), as described in FM 6-40.

7. Nuclear Burst Sighting Report

The format for transmission of nuclear burst measurements is contained in appendix V.

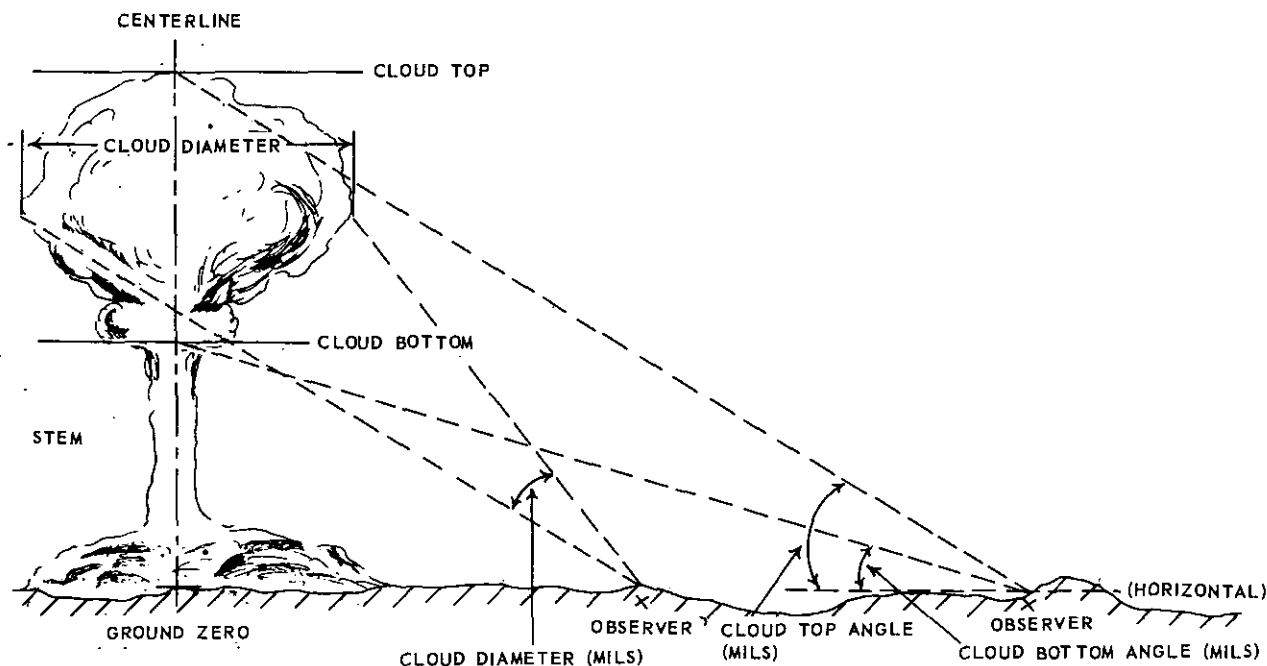


Figure 84. Cloud measurements.

8. Yield Estimation

a. If any of the following combinations of burst measurements are known, a nuclear yield can be estimated.

- (1) Flash-to-bang time and width of fire-ball.
- (2) Flash-to-bang time and cloud-top angle.

(3) Flash-to-bang time and cloud-bottom angle.

b. Values of any of the measurements (a above) can be indexed on the M4 nuclear yield calculator and a corresponding weapon yield determined. In the absence of the M4 calculator the yield can be determined by using nomograms contained in TM 3-210.

Section III. CHEMICAL AND RADIOLOGICAL MONITORING AND SURVEY

9. General

a. The armor unit is one of the principal agencies that will conduct chemical and radiological monitoring and survey. The air monitoring and survey missions will be performed primarily by the air cavalry troop. This section discusses the conduct of these operations in general terms, as applicable to armor units, and explains the terminology used to describe monitoring and survey.

b. Armor units are trained and equipped to perform chemical and radiological monitoring as a part of their routine activities. Survey missions will be assigned to these units. Air vehicles of the air cavalry troop perform monitoring and survey operations and should be used to facilitate the accomplishment of survey missions.

c. For additional information concerning chemical and radiological monitoring and survey operations, see FM 3-12 and FM 21-40.

10. Definitions

a. *Radiological Monitoring.* Actions taken to detect the presence and measure the intensity of radiation by use of radiac instruments.

b. *Radiological Survey.* A systematic search to determine the location, extent, and dose rate of radiation in specific locations or throughout an area.

c. *Chemical Monitoring.* Actions taken to detect the presence, and give warning of toxic agents by use of detection paper, detection crayon, or alarm devices.

d. *Chemical Survey.* A systematic search to determine the location, extent, and agent contamination in specific locations or throughout an area, with the chemical agent detector kit.

e. *Survey Party.* A survey party normally consists of a monitor and an assistant. The survey party may be mounted in a ground or air vehicle, or dismounted as required by the type of contamination. The assistant may drive the vehicle, fly the air vehicle, and operate the radio. A ground survey party may be augmented by additional persons for security or other reasons.

f. *Control Party.* A control party is a group of individuals that coordinates the efforts of two or more survey parties under its control and reports radiological data to higher echelon.

g. *Survey Team.* A survey team consists of a control party and two or more survey parties.

11. Monitoring Operations

a. Chemical and radiological monitoring is a command responsibility performed by armor units. It is a protective measure to detect and warn all personnel of the presence of chemical or radioactive contamination.

b. All armor and air cavalry units are equipped with radiac instruments and chemical agent detection and identification equipment to perform radiological and chemical monitoring. A monitor and assistant monitor should be trained to operate the equipment.

c. Monitoring activities may be conducted on a periodic or continuous basis using the ground or air method. While a unit is moving, it is advisable for designated persons to perform continuous monitoring to prevent movement into an area of dangerous contamination without warning. When the unit has occupied a position or an area, periodic monitoring may suffice.

d. The objective of monitoring is to determine the presence or absence of significant

levels of radiation or chemical contamination and not to determine accurate ground dose rates or concentrations unless the monitor is directed to do so.

12. Survey Operations

a. When an armor unit is assigned a survey mission the size, number, and composition of the survey team is based on a consideration of the persons available, equipment on hand, the size of the area to be surveyed, the road net in the area, and the information desired. Survey personnel must be protected from contamination. The cumulative dose of radiation acquired by a person must be considered. No one must be permitted to exceed dosages specified by command guidance.

b. Survey by air is employed in areas that have contamination or dose rates that would be

unacceptably dangerous to ground survey parties, along lines of communication, over areas under consideration for relocation of units and installations when speed is important, and over areas of difficult accessibility to ground troops.

13. Reporting Data

a. Information obtained while conducting chemical and radiological monitoring operations should be forwarded through command channels.

b. Chemical and radiological data gathered during a survey operation is reported directly to the division chemical, biological, and radiological elements (CBRE) or through command channels, depending on the type of survey being conducted.

APPENDIX XXIV

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL PROTECTIVE MEASURES

1. Purpose

This appendix presents individual and unit protective measures and damage control operations common to all armor units. Included are measures employed to reduce the probability of detection and minimize the effects of enemy nuclear, chemical, artillery, mortar, and air-delivered weapons; and procedures for conducting damage control operations in the event the enemy uses mass destruction weapons. Many of these measures apply when nuclear weapons are employed in close support of friendly armor units.

2. Definitions

a. Active Protective Measures. Active protective measures include all positive means taken to engage, destroy, or neutralize the enemy forces, his weapons, and his intelligence efforts.

b. Passive Protective Measures. Passive protective measures are means taken before, during, and after an action to prevent detection or to minimize the effect of enemy attack.

c. Chemical Weapons. Chemical weapons are toxic chemical agents, not including non-toxic agents such as flame and smoke.

d. Nuclear Weapons. Nuclear weapons are weapons that result in a nuclear explosion, regardless of delivery means.

e. CBR Monitoring and Survey. See paragraph 15, this appendix.

f. Area Damage Control. This consists of measures taken before, during, and after a mass destruction attack or natural disaster to minimize its effects.

3. Protective Measures in Nuclear Warfare

Nuclear detonations have three primary effects—blast, thermal radiation (heat), and nu-

clear radiation. Blast injuries are caused by collapsing buildings and flying debris. Blast damage to materiel is due primarily to the violent displacement of the materiel by the shock wave. Thermal radiation casualties are caused by burns resulting from flash heat. Nuclear radiation casualties result from damage to or destruction of living body tissue. For information of the effects of nuclear explosions, see FM 101-31. For information on residual radiation, see FM 3-12 and TM 3-210.

4. General Protective Measures

a. Training. The nuclear weapon, although a tremendously destructive military device, is not a weapon against which there is no defense. This fact must be firmly established early in the training of any unit. The more each soldier knows about what the weapon can and cannot do, the more effective he will be on the nuclear battlefield and the greater will be his chances for survival. Training must stress the inter-related importance of discipline, camouflage, cover, concealment, dispersion, and immediate reaction for battlefield survival. (See FM 21-40 for small unit procedures, and FM 21-41 for individual protective measures.) Field exercises should always include application of unit and individual protective measures. The fact must be emphasized that armor units because of their equipment and method of operation are much better suited for the nuclear battlefield than any other combat unit. Personnel must be fully aware that the immediate effects of a nuclear explosion may last for 90 seconds, while the residual or delayed effects may last for several days.

b. Unit Standing Operating Procedure. Conditions on the nuclear battlefield will require that many individual protective measures be performed without detailed direction. The SOP of each armor unit must include proce-

dures to be followed in connection with friendly and enemy employment of nuclear weapons. The SOP should provide—a warning system, of friendly or enemy weapons employment, routine procedures for protection of equipment and personnel, use of radios, and certain specified reports. The measures prescribed by the SOP should be rehearsed at every opportunity.

5. Concealment as a Protective Measure

a. General. Concealment consists of any measure that prevents personnel or equipment from being seen by the enemy, but which provides little or no protection.

b. Camouflage. Camouflage includes all measures taken to mislead the enemy by concealment and deception. Successful camouflage depends on the selection of position, the discipline of the personnel involved, and the use of natural material and artificial construction. FM 5-20 contains procedures and techniques of camouflage.

c. Night Operations. An effective way to obtain concealment is to conduct movements and tactical operations during hours of darkness or very limited visibility. Difficulties encountered in night operations can be minimized through adequate training, planning, and supervision.

6. Mobility as a Protective Measure

The mobility of armor units provides an extremely effective means of passive protection. The armor unit can be a fleeting target that is capable of rapid movement from widely dispersed areas, brief concentration, and subsequent rapid dispersal. Mobility permits armor units to move quickly through or out of an area of radioactive or chemical contamination. Retention of mobility is essential to successful armor operations. Other protective measures should be employed that would not restrict the movement of armor units.

7. Protection Afforded by Armored Vehicles

a. General. Armored vehicles provide much protection to troops against the effects of a nuclear explosion.

b. Tanks. A tank provides excellent protection for persons in it. This protection is roughly equivalent to that provided by a 4-foot-

deep foxhole with overhead cover. The SOP must require that all unnecessary items, such as empty shell casings or ration boxes, be removed from the vehicle and all necessary items be secured in the vehicle. In an active nuclear war, tank crews may have to operate with hatches closed for maximum protection. The decision to accept a greater risk and to operate with hatches open is taken by the commander concerned.

c. Armored Personnel Carriers. Armored personnel carriers provide protection against the effects of nuclear explosions for persons in the vehicle, though not as much as a tank. There should be no loose material or equipment in the vehicle that might fly around and cause injuries, and occupants should wear helmets. The protection against nuclear effects is generally the same as that afforded by the tank (*b* above), except for a lesser degree of nuclear radiation, and the same considerations apply.

8. Protective Measures for Dismounted Personnel

Personnel of an armor unit will not have the protection of an armored vehicle at all times. It is essential that members be well trained in protective measures to use if they are dismounted.

a. Protection Against Blast. The immediate reflex action of a person caught in the open at the time of a nuclear explosion should be to hit the ground. Shallow ditches or even slight folds in the ground provide some protection against flying debris. Individual emplacements, such as foxholes or prone shelters, offer better protection. If time and the tactical situation permit, the most effective individual shelter to use, with the exception of a tank, is a well-constructed 2-man foxhole with overhead cover. This shelter should be dug in firm ground, revetted, and kept free of loose objects. The overhead cover should be as substantial as possible.

b. Protection Against Thermal Radiation (Heat). The thermal effects of a nuclear explosion are emitted instantaneously in all directions at the speed of light. Thermal casualties result from burns on bare skin and to a lesser extent through clothing. Persons caught in the

open at the time of the explosion will be exposed immediately to this effect and will be unable to react rapidly enough to avoid it; however, any shadow-producing object or terrain feature provides protection against thermal radiation. Unit SOP's must require that troops reduce to the minimum the amount of bare skin exposed when in the open. Shirts and jackets should be worn with sleeves rolled down, and gloves should be worn whenever practical. Personnel must be trained never to look at the fireball of an explosion, to avoid injury to their eyes. Armored vehicles and shelters having overhead cover afford excellent protection from thermal effects. Placing a shelter half over an otherwise open trench or foxhole gives effective protection. The use of combustible items for overhead cover should be avoided.

c. Protection Against Nuclear Radiation. Nuclear radiation is the effect least understood by the average soldier. Protection from nuclear radiation may be obtained by placing dense material between the radiation source and the individual. One and one-half inches of steel or 7½ inches of earth will reduce initial nuclear radiation by 50 percent. To be effective, shielding must be on all sides. Thus, 3 inches of steel in the hull and turret of a tank, or 15 inches of earth, will reduce the initial nuclear radiation to one-fourth of the unprotected intensity. Initial nuclear radiation is emitted at the same time and velocity as thermal radiation, but to a shorter range. Initial nuclear radiation is emitted from the fireball at the time of the explosion, and from the cloud for about 1 minute after the burst, until the cloud is too high for the radiation to reach the ground. Initial nuclear radiation must not be confused with residual radiation, which is fallout in areas downwind from the target area or as neutron-induced radiation in the immediate vicinity of ground zero. Persons in the open within range of this effect at the time of explosion cannot act quickly enough to avoid all of the initial nuclear radiation. A tank or a 4-foot-deep foxhole with adequate overhead cover provides the best available protection. The armored personnel carrier and other shelters discussed above provide partial protection against this hazard.

d. Protection Against Fallout. A surface or

subsurface nuclear explosion causes the radioactive hazard of fallout. The explosion lifts tremendous quantities of earth particles into the nuclear cloud formed at the time of detonation. This material is highly radioactive and particles are carried downwind and eventually fall back to earth. The particles are known as fallout, the lingering hazards from fallout may cover many square miles. The presence and intensity of residual radiation is determined by radiological monitoring and survey, procedures for which must be specified in unit SOP's, based on FM 3-12 and TM 3-210. If the tactical situation permits, an effective protective measure is prompt movement out of the area before fallout begins or as soon as possible after it has been detected. In some situations it may be better to remain in the area and take maximum individual and unit protective measures. Once residual radiation has been detected, the unit continues its mission, relocating in its assigned sector to minimize radiation exposure, and reports the presence of radioactivity to the next higher headquarters, which may direct movement out of the area. If it is necessary to remain in the fallout area, the protective measures against the other effects discussed previously will be effective against fallout. Armored vehicles must be buttoned up completely with the crews remaining inside. Shelters should have overhead cover. The period of time a unit may remain in the contaminated area depends on the total dose of radiation the troops can receive and still remain effective, the intensity of the radiation, and the protection available. The amount of time spent away from cover should be kept to the minimum. The radioactive dust that collects on top of shelters and vehicles should be brushed away at intervals, and complete decontamination should be accomplished at the first opportunity. The protective mask prevents breathing and swallowing of radioactive particles, and is used when dust concentration makes breathing difficult.

9. Unit Protection Against Nuclear Weapons

a. General. A unit's protection is no more effective than the collective protective measures taken by its individuals. The fundamental purpose of both individual and unit protective

measures is to maintain the combat efficiency of the unit. The number of protective measures an armor unit can take depends on the tactical situation. There are certain measures that can be taken in almost any situation.

b. Smoke. The use of smoke decreases materially the thermal effects of either a friendly close support weapon or an enemy nuclear attack. Dense fog, heavy snow, or rain provide similar protection.

c. Dispersion. Dispersion is an excellent protective measure, primarily because it makes target acquisition more difficult and the target less attractive. If the tactical situation and the size and characteristics of the available area permit, approximately 4,000 meters should be maintained between perimeters of adjacent battalions, or 6,000 meters between their centers of mass. These desirable dispersal distances should be considered in the assignment of assembly areas, axes of attack, objectives, and defensive positions. Armor units cannot disperse so much that they will be tactically ineffective. The terrain, or the enemy capability or willingness to mass and maintain a certain force in a given area, may require more concentrated dispositions to accomplish the mission.

d. Position Selection. Within the restrictions imposed by the tactical situation, unit positions should be selected on terrain that provides natural shielding from nuclear weapons effects. Casualties resulting from secondary blast effects (flying debris) are more likely in built-up areas than in open country.

10. Unit Protective Procedures Against Nuclear Weapons

The unit protective procedures described below should be routine in armor units. Procedures employed to protect against possible effects of a friendly nuclear attack, should not be so obvious that the enemy will be warned.

a. Whenever the direction from the unit's position to the point where nuclear explosion will occur can be determined, as when friendly weapons are to be used, vehicles should be positioned to take advantage of cover offered by the terrain.

b. Whenever possible, just before the friendly employment of a nuclear weapon, tank turrets are rotated so that the main gun is facing away from the blast, to prevent damage to the fire control equipment.

c. Tools and light equipment, such as those used by kitchen and maintenance personnel, should be secured to reduce the missile hazard in the area.

d. Special instruments for determining the intensity of residual radiation should be maintained in an operative condition, and enough persons should be trained in their use. During periods when the unit is subject to fallout, the dose-rate meters should be used to take readings of intensities and determine the presence of radioactivity. Unit SOP's must establish frequency and reporting procedures.

e. Such activities as feeding, supply, maintenance, training, and recreation should be staggered so that a minimum number of troops are out of cover.

11. Protection Against Chemical and Biological Attack

Armor units must train their personnel to apply protective measures against toxic chemical and biological attack. Unit SOP's should include actions to be taken in the event of such attacks. Protective measures should provide for—an adequate warning system; use of individual and unit protective equipment; facilities for prompt decontamination of individuals, equipment, and supplies; and prompt treatment of casualties. For additional information see FM 3-5, FM 21-40, and FM 21-41.

12. Protective Equipment and Shelters Against Chemical Attack

a. The individual's primary protection against toxic chemical attack is his protective mask. The mask protects against inhalation of toxic chemical agents, biological agents, and radioactive material.

b. Armored vehicles may be provided with a gas particulate filter unit. This filter unit consists of an air purifier, which supplies a generous amount of purified air to hose connections to which individual tank protective masks with canisters are attached. These individual

masks, which may be detached from the air purifier when crew members leave the tank, give the same protection as the individual protective mask. Each individual (tank) mask is equipped with a built-in microphone, which connects to the vehicle intercom system.

c. Rarely do armor units construct or use protective gasproof shelters. Instead, they take advantage of their mobility to avoid or rapidly pass through contaminated areas. Personnel decontamination stations may be established that provide showers, an exchange of personnel equipment, and the issue of new or laundered clothing.

13. Biological Attack

Definite information on the employment of biological agents by the enemy is disseminated from higher headquarters, but each armor unit must be alert to the danger and report promptly the unusual occurrence of diseases. The best local defense against biological warfare is strict enforcement of all preventive medical and sanitation measures and high standards of personal hygiene.

14. Chemical, Biological, and Radiological Monitoring and Survey Operations

In the event CBR weapons are employed by an enemy, armor units will frequently be required to perform CBR monitoring or conduct CBR survey operations. Each unit SOP must contain specific guidance in the conduct of CBR monitoring and survey operations.

15. Definitions

a. *CBR Monitoring.* This process determines the presence and, when possible, the amount of chemical, biological, or radiological contamination in an area. It may include any combination of the following:

- (1) *Chemical monitoring.* The detection of toxic chemical agents, generally by the use of a chemical agent detector kit.
- (2) *Biological sampling.* The sampling of biological agents using sampling kits when available.
- (3) *Radiological monitoring.* The use by a person (monitor) of radiac instruments to detect and measure radiation.

b. *CBR Survey.* This is a systematic use of survey parties to determine the location, extent, and, as applicable, dose rates or CBR contamination in specific locations or throughout an area. In the following surveys, survey parties determine:

- (1) *Chemical survey.* The location and limits of an area known or suspected to be contaminated by chemical agents.
- (2) *Biological survey.* The location and limits of an area known or suspected to be contaminated by biological agents.
- (3) *Radiological survey.* The location and dose rate of radiation in specific locations or throughout an area.

c. *Survey Party.* A survey party normally consists of a monitor and an assistant. A survey may be made mounted in a ground or air vehicle, or dismounted, as required by the type of contamination. The assistant may drive the vehicle or operate the radio.

d. *Control Party.* A control party is a group that coordinates the efforts of two or more survey parties under its control and reports CBR data to higher echelon, or chemical, biological, radiological center.

e. *Survey Team.* A survey team consists of a control party and two or more survey parties.

16. Employment of Armor Unit Survey Operations

When an armor unit is assigned a survey mission, the size and composition of the survey team are based on the number of unit personnel that can be diverted from the primary mission, the equipment on hand, the area to be surveyed, and the information desired. CBR protection must be afforded the survey team. The cumulative dose of radiation acquired by individuals must be considered. Individuals must not be permitted to exceed dosage specified by current command guidance.

17. Reporting CBR Data

a. Information gathered by CBR monitoring operations should be forwarded through command channels.

b. Survey information may be reported directly to the division CBRC or through command channels depending on the type of survey being conducted.

18. Area Damage Control Operations

a. Area damage control consists of measures taken before, during, and after a mass destruction attack or natural disaster to minimize its effects.

b. In forward areas these measures are directed primarily toward minimizing interference with tactical operations and the loss of combat power.

c. Area damage control activities are a command responsibility, and the commander at each echelon is responsible for damage control training and implementation of damage control plans. The commander must direct all measures and means at his disposal toward accomplishment of the tactical mission, and at the same time minimize the possibility of losses of personnel and materiel to an enemy mass destruction attack.

19. Area Damage Control Measures

Certain area damage control measures must be accomplished before an operation—

a. Damage control organizations and procedures must be established in workable damage control SOP's.

b. Units and individuals must be thoroughly trained in the use of passive protective measures (pars. 3-17) against an enemy nuclear attack.

c. Area damage control training in conformance with established SOP's must be integrated with all phases of tactical training.

20. Decontamination Measures

a. *Radiological Decontamination.* Radiologi-

cal decontamination unit and individual measures are taken to reduce the dose rate resulting from fallout. They may include—

- (1) Brushing or sweeping off clothing and equipment. If possible a complete change of clothing should be issued and the old laundered.
- (2) Bathing as soon as possible.
- (3) Turning over the soil in the immediate area of foxholes, vehicles, and occupied installations. This buries the fine fallout particles and reduces intensity.
- (4) Hosing or washing equipment and vehicles. Soap or detergents should be used at the earliest opportunity.

b. *Decontamination of Vehicles after Chemical Attack.* A contaminated armored vehicle will continue its mission until the tactical situation permits first-echelon decontamination by the crew. For very light contamination, exposure to the weather may be sufficient for decontamination. Decontamination of the interior of the vehicle may be accomplished by the use of forced hot air or wiping with rags. Other expedients are protective ointment (on small critical areas) and solvents such as kerosene, fuel oil, and diesel oil; when such expedients are used, they must be washed off or otherwise removed before damage occurs to sensitive materiel. To decontaminate the outside of a vehicle the crews will spray the vehicle with decontaminating apparatus. Should this prove insufficient, specially trained individuals may scrub the entire vehicle with hot soapy water or apply the bleach slurry or DANC method. Third-echelon decontamination is performed at decontamination points in maintenance areas by vehicle crews and power-driven decontaminating apparatus. For additional information see TM 3-220 and FM 21-40.

APPENDIX XXV

ASSEMBLY AREAS

1. General

An assembly area is an area in which a unit is assembled preparatory to future action. In this area orders are issued, the unit services and repairs vehicles, receives and issues supplies, and feeds troops. The assembly area, when used to prepare for an attack, is usually well forward but if possible should be out of range of enemy light artillery.

2. Characteristics

a. Desirable characteristics of assembly areas include—

- (1) Concealment from air and ground observation.
- (2) Cover from direct fire.
- (3) Good drainage and a surface that will support vehicles.
- (4) Good exits and entrances, and adequate internal roads or trails.
- (5) Ample space for dispersion of vehicles, personnel, and equipment (approximately 2,000 × 2,000 meters for a battalion task force).
- (6) Adequate communication sites.
- (7) Be far enough away from other installations that together they do not present a lucrative nuclear target.
- (8) Offer, if appropriate, a suitable landing site for organic, attached, or supporting air vehicles.

b. Overhead concealment is important if the unit is to remain in the area for any length of time. Vehicles, equipment, entrances, and exits are camouflaged to keep the enemy from detecting the location of the unit. Maximum use should be made of available Army air vehicles to inspect overhead camouflage.

3. Organization

a. The individual in charge of a quartering party divides the area among the subordinate

units, the command post, and the trains, as appropriate. It is desirable to have the trains centrally located in the area and near the main road through the area.

b. If the individual in charge of a subordinate quartering party determines, from his reconnaissance, that the assigned area is unsatisfactory, he immediately notifies the individual in charge of the higher headquarters quartering party and requests a change of area. If a change cannot be made in the time available, the unit is located under the best available cover and concealment as soon as it arrives, and necessary adjustments are made later.

4. Occupation

Upon the arrival of a unit at an assembly area all elements move off the road and clear the route of march without slowing or halting. The posting of guides, selection of routes, and the allocation of areas by the quartering party are done with this objective in mind. This requires aggressive action on the part of guides and close supervision by commanders and staff officers. In designating locations in the area, the quartering party considers the unit's positions in the march column. The march route is not blocked while precise adjustments are made. After the march serial has cleared the route, any desired adjustments of vehicles can be made easily without holding up the flow of traffic (figs. 85, 86, and 87).

5. Security

a. Security in assembly areas is obtained by tactical disposition of troops, concealment, use of natural and artificial obstacles, reconnaissance, and the establishment of blocking positions and local security measures, including observation or listening posts covering all key terrain features and likely avenues of enemy approach.

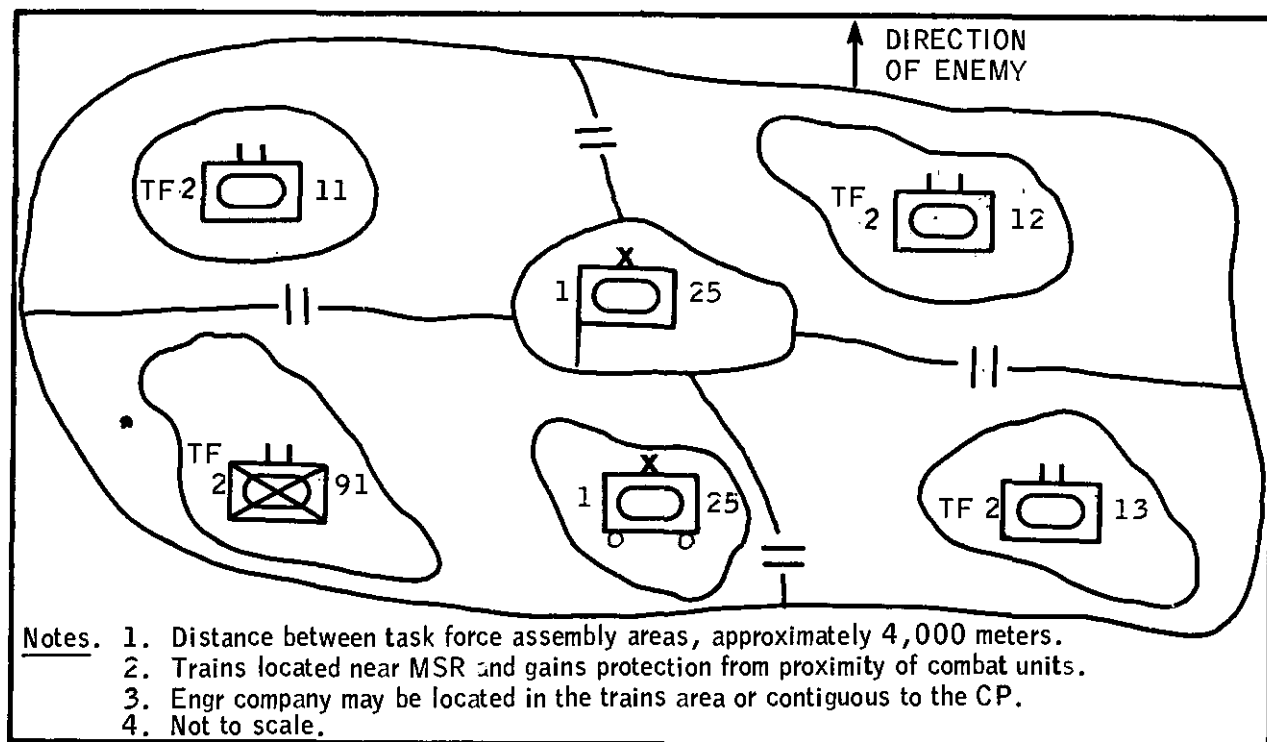


Figure 85. Diagram of a brigade assembly area.

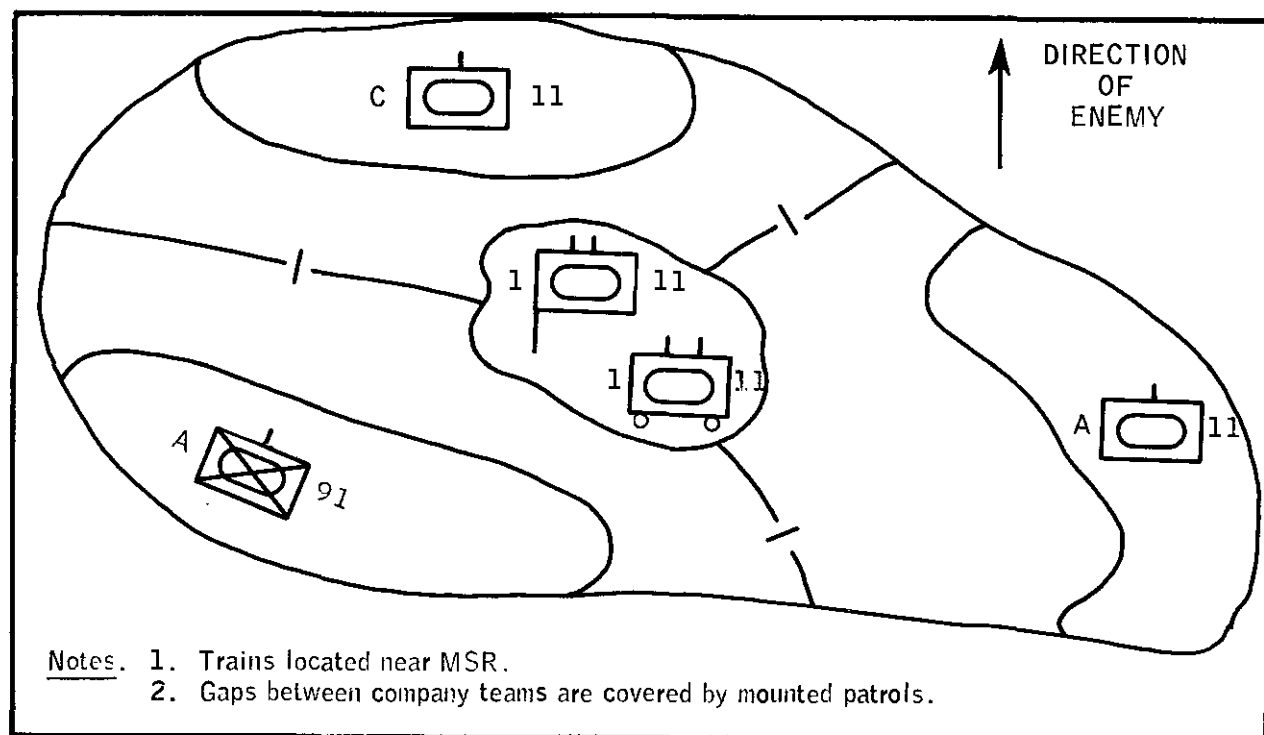


Figure 86. Diagram of battalion assembly area.

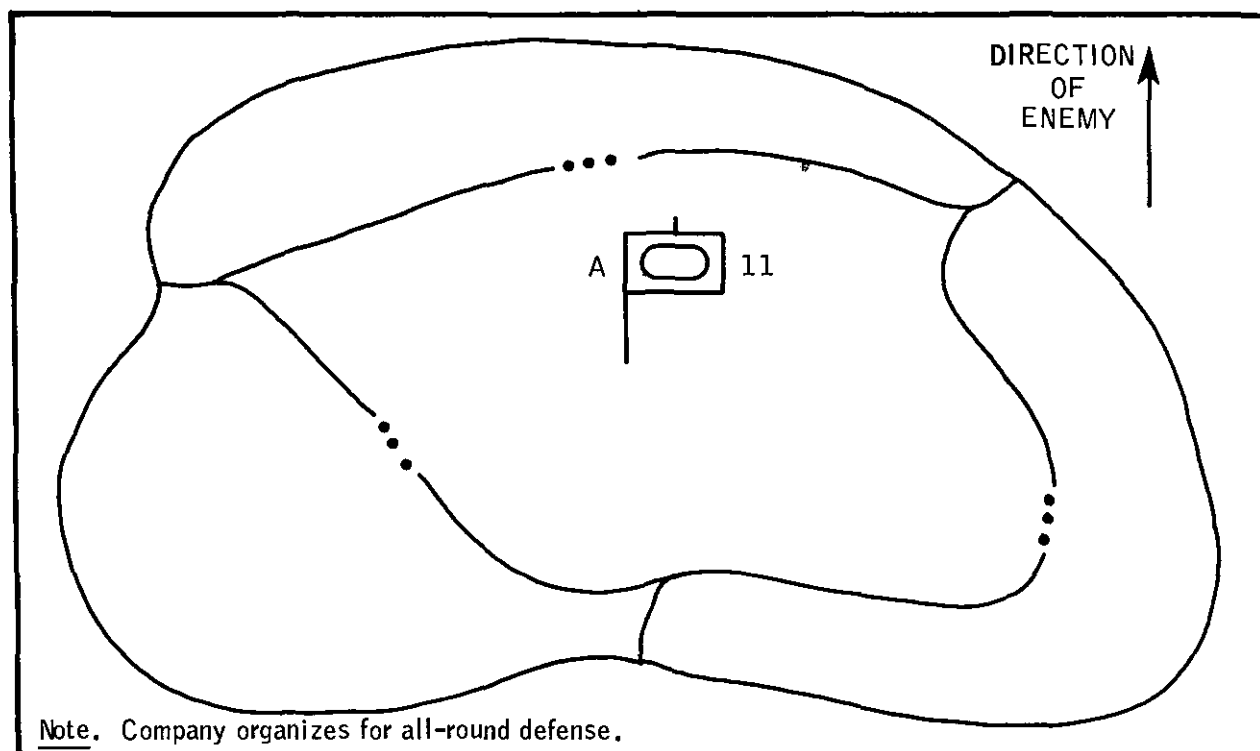


Figure 87. Diagram of company assembly area.

b. The size and disposition of security elements depend upon the anticipated enemy activity and the nature of the terrain. Blocking positions and observation and listening posts will be strong enough to provide security, but since such duty is tiring and reduces the subsequent combat efficiency of troops, the combat power of the main body should not be dissipated on unnecessarily large security detachments. The basic consideration is that the command must not be surprised.

c. When dividing the area among units of the force, the commander assigns boundaries between adjacent units and designates contact points at which liaison is to be established and maintained.

d. Protective minefields when authorized, are placed to provide local, close-in protection and warning of enemy approach. For discussion on the employment of mines, see appendix XIX.

e. Assembly areas, regardless of location, must have adequate security against hostile air and ground attack, patrol activities, and irregular forces.

6. Communication and Liaison

a. The signal communication system of an armor unit in a bivouac or assembly area consists of messenger, wire, radio, and visual means. Normally for security purposes, radio operation is minimized. Radio silence or listening silence may be directed.

b. Wire lines are kept to the minimum, depending on the time the area is to be occupied, but may be laid to units as necessary.

c. Each company sends a liaison agent (messenger) to the battalion command post. The battalion sends a liaison officer to the next higher headquarters.

7. Logistics

a. As a minimum, ammunition and fuel and lubricants are supplied. This supply must be supervised closely to insure that all vehicles have prescribed and basic loads prior to combat operations. When an assembly area is occupied for an extended period of time, additional supply is accomplished in accordance

with the situation. Replenishment of all classes of supply is accomplished if time permits.

b. In the assembly area, vehicular, weapons, and signal inspections and maintenance are among the primary considerations of the unit

commander. Vehicle crews and maintenance personnel must insure that equipment operates efficiently. Maximum effort should be devoted to completing those maintenance checks and repairs that cannot be accomplished properly during combat.

INDEX

	Paragraph	Page		Paragraph	Page
Advance guard.....	98	46	Base of fire.....	182	90
Advance to contact.....	202	104	Battalion:		
Agencies, reconnaissance.....	76	39	Fixing forces.....	241	121
Airmobile operations.....	366-383	187	Mechanized, role.....	8	6
Air support, tactical.....	233, 290-295	118, 150	Tank, role.....	7	6
Amphibious operations.....	366-383	187	Task Force.....	35	15
Area damage control.....	170-180	82	Trains.....	124, 127	63, 64
Area defense (<i>See</i> Defense)			Command group.....	52, App. II	20, 207
Armor:			Command post.....	52, App. II	20, 207
Capabilities.....	11	6	Communications.....	52	20
Command.....	55-60	23	Company:		
Command and staff.....	74	36	Tank:		
Commander.....	64-65	30	Role.....	7	6
Mission.....	10	6	Trains.....	128-130	64
Role.....	3, 4	5	Team.....	36	15
Planning.....	43-47	17	Control Facilities.....	52, App. II	20, 207
Armored:			Control Measures.....	App. X	271
Brigade:			Covering Force.....	106, 238, 241	52, 121
Role.....	6	5	Decontamination.....	175	83
Cavalry:			Defense:		
Role.....	9	6	Area.....	244-253	125
Trains.....	123, 127	62, 64	Command and control.....	232	118
Army Aviation.....	279-281	145	Considerations, basic.....	223	114
Artillery.....	274-278	141	Covering force.....	238, 241	120, 121
Attack.....	App. XI	280	Doctrine.....	222	114
Defense.....	235, App. XI	119, 280	Fire planning.....	233, App. XI, XIV	118, 280, 288
Organization.....	276	141	Fixing forces.....	239, 241	121
Planning.....	277	142	Mobile.....	237-243	120
Assault:			Conduct.....	243	124
Bridging.....	App. XVIII	319	Considerations.....	241	121
Objective.....	193	97	Planning.....	242	122
River crossing.....	340-352	169	Organization.....	231	118
Assembly Area.....	App. XXV	367	Planning.....	229	117
Attack:			Security and surveillance.....	234	119
Conduct.....	191-195	96	Striking force.....	240	121
Consolidation and reorgani- zation.....	195	99	Types.....	224-225	115
Continuation.....	194	98	Delaying action:		
Control measures.....	189, App. X	95, 271	Conduct.....	263	137
Envelopment.....	198	101	Planning.....	262	131
Exploitation.....	200	102	Estimate of the Situation.....	App. VII	244
Fire planning.....	App. XI, XIV	280, 288	Fire and Maneuver.....	19, 182, App. XIII	10, 90, 283
Formation.....	187	91	Flank Guard.....	99-104	47
Infiltration.....	201	103	Fundamentals, employment.....	17-28	10
Methods.....	190	95	Logistics:		
Night.....	215-220	110	Assembly Areas.....	138	69
Penetration.....	197	100	Attack.....	139, 140	69, 70
Planning.....	184-190	91			
Pursuit.....	200	102			
Tank/infantry team.....	192	96			
Turning movement.....	199	102			

	Paragraph	Page		Paragraph	Page
Logistics—Continued			Reconnaissance—Continued		
Battalion.....	123	62	Defense.....	234	119
Trains, combat.....	124, 125	63	Fire.....	82	43
Trains, field.....	126	64	Force.....	86, 206-208	44, 106
Company.....	128-131	64	Frontages.....	88	44
Defense.....	142-144	71	Fundamentals.....	77	39
Linkup.....	141	70	Instructions.....	90	44
Marches, support.....	137	68	Night.....	85	43
Personnel.....	114-122	59	Route.....	79	40
Principles.....	112, 113	58	Town, obstacle or enemy position.....	83	43
Retrograde operation.....	145-148	72	Zone.....	80	40
Squadron.....	123	62	Recovery operation:		
Trains, combat.....	124, 125	63	Air vehicles.....	161	80
Trains, field.....	126	64	Medical equipment.....	163	80
Meeting engagements.....	209-211	106	Signal equipment.....	162	80
METT.....	29-33	12	Vehicles.....	160	77
Mine warfare.....	App. XIX	322	Reports and Warnings.....	App. V	220
Movements.....	App. VI	227	Retirement Operation.....	269, 270	139
Mission type orders.....	26, 42	12, 16	Retrograde:		
Night combat techniques.....	App. XV	301	Combat Support.....	260	129
Nuclear warfare:			Considerations.....	256-260	128
Considerations.....	14-15	9	Screening Force.....	105	50
Reconnaissance (See Reconnaissance).			Security:		
Security (See Security)			Defense.....	234	119
Organization for combat.....	34	15	Forces.....	97, 238	46, 120
Defense.....	241	121	Frontages.....	95	46
Offense.....	186	91	Fundamentals.....	94	45
Passage lines.....	203-205	104	Nuclear and Chemical Attack.....	109	56
Principles of war.....	12, 13, App. VIII	8, 249	Spoiling Attack.....	243	124
Prisoners of war.....	App. XII	281	Staff:		
Radar.....	App. XXII	349	Battalion:		
Rear:			Special.....	69	34
Area security.....	108	55	Unit.....	66-68	30
Guard.....	107	53	Records.....	App. IV	217
Reconnaissance:			Tank sweep.....	243	124
Agencies.....	76	39	Task organization.....	App. XVII	317
Air vehicle.....	87	44	Troop leading procedure.....	61-63	25
Area.....	81	43	Withdrawal operations:		
Bridge or defile.....	84	43	Consideration.....	265	137
Control and coordination.....	89	44	Daylight.....	268	138
			Night.....	267	138

By Order of the Secretary of the Army:

EARLE G. WHEELER,
*General, United States Army,
Chief of Staff.*

Official:

J. C. LAMBERT,
*Major General, United States Army,
The Adjutant General.*

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NG: State AG (3); units—same as active Army except allowance is one copy to each unit.

USAR: Units—same as active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320-50.

APPENDIX XI
GUIDE FOR THE PREPARATION OF FIRE PLANS

MARGINAL INFORMATION

Unit
Location and coordinates
Time Date

TITLE:
MAP (Reference-Scale):

1. Plan of maneuver of supported unit.
 2. Priority of fires.
 3. Requests to higher headquarters for additional fire support.
 4. Requests for clearance of smoke missions and fires outside zone of supported unit.
 5. Davy Crockett and 4.2-inch mortar employment.
 6. Requests for groups and series of fires.
- (No standard number of paragraphs or sequence of information is prescribed. The purpose of this section is to convey information not shown graphically.)

Signature
Title

Target List

No.	Description	Location	(Alt Meters)	Remarks
DA101	Machinegun	40731308	412	Dug-in patrol
DA102	Entrenchment	40891286	398	Pl 25 meters
DA103	Suspect OP	40861258	426	Map
DA121	Mortar	42031310	354	Radar 50 meters
DA201	Machinegun	41231158	360	Dug in
DA202	Recoilless rifle	41251136	358	
DA211	Road Junction	42611191	337	
***	***	***	***	***

1. All concentrations shown in graphical parts will be listed in this section.
2. All concentrations listed are available to be fired on call.
3. Description column and remarks column must be in sufficient detail to assist the S3 to evaluate the target.
4. Table filled out concurrently with graphical section.
5. Remarks will be added in a remarks column or the body of the table where necessary.

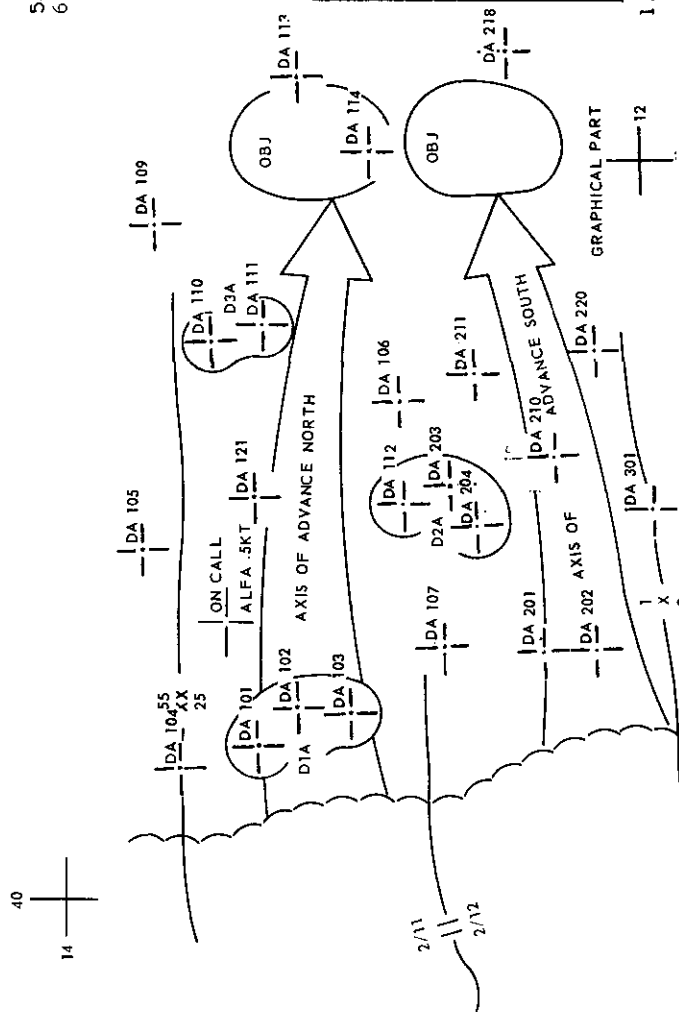
Groups of Fires

Unit (Btry or Bn)	D1A	D2A	D3A	D4A	D5A
A	DA101	DA112	DA110		
B	DA102	DA203	DA111		
C	DA103	DA204			

1. Groups of fires are planned to cover a single tactical locality too large to be covered by a single concentration.
2. Each concentration in a group of fires is assigned to a separate fire unit (battery or battalion).
3. Concentrations may be made into groups of fire without regard to the agency planning the concentrations.
4. Groups of fires are fired on call.
5. The artillery battalion S3 will plan groups of fires based on recommendations of the task force liaison officers and will assign the number-letter-number designation for each group of fires.

Figure 60. Guide for the preparation of fire plans.

Appendix XI. GUIDE FOR THE PREPARATION OF FIRE PLANS



GRAPHICAL PART

1. Show concentrations by tick mark, identified by the appropriate number and letter prefix, except any target larger than 100 meters must be outlined in size and shape.
2. Friendly information such as boundaries, line of departure, and objectives may be shown.
3. Where appropriate, make groups of fires to cover single tactical localities too large to be covered by one concentration.
4. Show two "tick" marks for orientation of overlay.
5. This section is prepared by consolidating the various artillery fire plans for the battalion task forces and eliminating any duplications. Additional concentrations are planned based on the fire support part of the commander's concept and information received from the artillery S2.
6. Concentrations are planned on known enemy locations, suspected enemy locations, and terrain features including likely avenues of approach, likely assembly areas, terrain adaptable for weapons locations, and terrain features suitable for shifting of fire and orientation of observers or the maneuvering elements. Concentrations are planned on any target that can affect the supported unit and are not restricted by boundaries. However, these targets are not fired on without coordination with and authority of the unit in whose zone they are located.

Schedule of Fires

BN	BTRY	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	+4
	A	DA121 36	DA110 36	DA111 34	DA101 34	DA103 36						DA102 36
2/50	B	DA121 36	DA112 34	DA107 36	DA101 34	DA103 36						DA102 36
ARTY	C	DA121 36	DA114 36	DA210 34	DA101 34	DA103 36						DA102 36
2/12	Mortar Plat				DA107 34	DA202 36						DA201 34
Armer	B											

1. Schedule is blocked out for the appropriate time in 2-minute time blocks for each unit.
2. Show the following in each block:
 - a. The concentration to be fired.
 - b. A horizontal bar showing the starting time of the concentration, and the time firing must be completed.
 - c. Below the horizontal bar, the amount of ammunition to be expended per unit.
3. An appropriate time interval for shifting to next target and control will be left between concentrations depending on the unit SOP. (An SOP might be 2 minutes for light artillery and mortars and 3 minutes for medium artillery.)
4. The force commander will determine the length of the preparation. Fires of direct support battalions will normally be scheduled to include a short period after H-hour.
5. Additional schedules may be prepared to be fired on call or upon the happening of a certain event during the operation.
6. Scheduled fires may be interrupted for on-call missions of decisive importance.
7. Fires directed by higher headquarters will be scheduled first. Fires requested by the supported unit and finally other appropriate artillery targets will then be scheduled.
8. Scheduling of fires will be coordinated with the fires of armor and infantry supporting weapons, close air support, and naval gunfire.
9. The time allotted for firing each concentration will be determined by the ammunition to be expended and the maximum rate of fire of the weapons.

DISTRIBUTION

Distribution of this plan, or parts thereof, will be made to the supported unit, mortar/ Davy Crockett platoons, division artillery, all liaison officers and forward observers, and to any artillery battalions that have a mission of reinforcing this direct support battalion.